HEALTH AND SAFETY PLAN
FOR THE
AMERICAN GLUE & RESIN SITE
MIDDLETON, MASSACHUSETTS

Prepared For:

U.S. Environmental Protection Agency
Region I
John F. Kennedy Federal Building
Boston, Massachusetts

CONTRACT NO. 68-W5-0009

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Roy F. Weston, Inc.
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Region I

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GLOSSARY OF ACRONYMS

ACM	-	Asbestos-Containing Material
ANSI	-	American National Standards Institute
APR	-	Air Purifying Respirator
ACGIH	-	American Conference of Governmental Industrial Hygienists
BNA	-	Extractable Base/Neutrals and Acids
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	-	Code of Federal Regulations
CGI	-	Combustible Gas Indicator
CRC	-	Contamination Reduction Corridor
CRZ	-	Contamination Reduction Zone
CSEP	-	Confined Space Entry Permit
CZ	-	Clean Zone
DECON	-	Decontamination
DEP	-	Department of Environmental Protection
DOT	-	Department of Transportation
ERRS	-	Emergency Response Cleanup Services
HNU-PID	-	HNU Photoionization Detector
EZ	-	Exclusion Zone
IDLH	-	Immediately Dangerous to Life or Health
LEL	-	Lower Explosive Limit
mR/hr	-	Milliroentgen Per Hour
NCP	-	National Contingency Plan
NIOSH	-	National Institute for Occupational Safety and Health
OERR	-	Office of Emergency and Remedial Response
OSC	-	On-Scene Coordinator
OSHA	-	Occupational Safety and Health Administration
OVA	-	Organic Vapor Analyzer
PCB	-	Polychlorinated Biphenyl
PEL	-	Permissible Exposure Limit
POLREP	-	Pollution Report
PPB	-	Parts Per Billion
PPE	-	Personal Protective Equipment
PPM	-	Parts Per Million
PRP	-	Potentially Responsible Party
RM	-	Response Manager
SCBA	-	Self-Contained Breathing Apparatus
STEL	-	Short-Term Exposure Limit
SOP	-	Standard Operating Procedure
SPCC	-	Spill Prevention Controls and Countermeasures
START	-	Superfund Technical Assessment and Response Team
TLV	-	Threshold Limit Value
TWA	-	Time Weighted Average
U.S. EPA	-	U.S. Environmental Protection Agency
VOC	-	Volatile Organic Compound

1.0 INTRODUCTION AND REGULATORY REQUIREMENTS

1.1 Introduction and Site Entry Requirements

This document describes the health and safety guidelines developed for the American Glue and Resin Site, to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous substances. The procedures and guidelines contained herein are based upon the best available information at the time of the plan's preparation. Specific requirements will be revised by the On-Scene Coordinator (OSC) when new information is received or conditions change. Any amendments to this plan will be incorporated into the safety procedures and documented in Appendix A. Where applicable, specific Occupational Safety and Health Administration (OSHA) standards or other guidance will be cited and employed.

1.2 Applicability

This plan addresses the safety procedures that will be followed by all personnel involved in this Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action, and any persons that may visit the site. All personnel entering the Exclusion Zone (EZ), or Contamination Reduction Zone (CRZ), shall read and sign this safety plan. Protocol set forth herein will remain in effect until the OSC certifies that activity is terminated. This plan does not supersede any Federal, OSHA, State, or Local regulations. In the event of a conflict between this plan and a regulation, the more stringent of the two will be enforced. The plan is in accordance with, and refers to, the terminology used in the Office of Emergency and Remedial Response (OERR) *Standard Operating Safety Guides* (June 1992).

1.3 Responsibilities

1.3.1 U.S. Environmental Protection Agency On-Scene Coordinator (OSC)

The National Oil and Hazardous Substance Pollution Contingency Plan (NCP) authorizes the OSC to coordinate and direct federally financed response or cleanup activities at the site. The NCP also makes the OSC responsible for addressing worker safety concerns at the site (See 40 CFR 300.135 and .150).

At this removal action site, the primary responsibilities of the OSC (Health and Safety Officer) relative to safety include the following:

a. To ensure that all personnel allowed to enter the EZ or CRZ (i.e., EPA, contractors, and visitors) are aware of the potential hazards associated with substances known or suspected to be on site.

b. To ensure that said personnel are aware of the provisions of this plan and are instructed in the safety practices defined in the plan, including its emergency procedures.

c. To ensure that the appropriate safety equipment is available and properly utilized by all personnel on site.

d. To direct the efforts of the Site Safety Monitor (START personnel).

e. To correct any work practices or conditions under OSC control that may result in exposure to hazardous substances or injury to personnel.

The OSC may amend this Health and Safety Plan in writing, using Appendix A, as warranted by site conditions.

1.3.2 Emergency Rapid Response Services (ERRS) Contractor

The Response Manager (RM), as the field representative for the ERRS cleanup contractor, has the responsibility for fulfilling the terms of the Delivery Order and ensuring ERRS and its subcontractor's compliance with the site Health and Safety Plan. The RM must oversee the project and ensure that all technical, regulatory, and safety requirements are met. It is the RM's responsibility to communicate with the OSC as frequently as dictated by the OSC, but at least daily, regarding site cleanup progress and any problems encountered.

1.3.3 Superfund Technical Assessment and Response Team (START)

The START contractor (Site Safety Monitor) is responsible for providing the OSC with assistance and support relative to all technical, regulatory and safety aspects of site activity. START is also available to advise the OSC on matters relating to sampling, treating, packaging, labeling, transporting, and disposing of hazardous materials, but is not limited to the above-mentioned activities.

1.3.4 Key Personnel

U.S. Environmental Protection Agency

On-Scene Coordinator (OSC): Gilberto Irizarry
United States Environmental
Protection Agency
John F. Kennedy Federal Building
Boston, MA 02111-0001
(617) 918-1255

Region I OSRR Safety Officer:	Robert Hinten United States Environmental Protection Agency John F. Kennedy Federal Building Boston, MA 02111-0001 (617) 918-1220
Alternate OSCs:	To be determined
Site Health & Safety Officer:	OSC Gilberto Irizarry
Local Lodging:	Not Applicable

Superfund Technical Assessment and Response Team (START):

Lead On-Site START member:	Stephen Amirault Roy F. Weston, Inc. 217 Middlesex Turnpike Burlington, MA 01803 (781) 229-6430, ext. 225
Region I Safety Officer:	Paul Callahan Roy F. Weston, Inc. 217 Middlesex Turnpike Burlington, MA 01803 (781) 229-6430, Ext. 242 Pager No. (781) 958-9297
Additional On-Site START Members:	To be determined
Local Lodging:	Not Applicable

Emergency Rapid Response Services (ERRS) Contractor

Response Manager (RM):	Daniel Hackett I.T. Corporation 88C Elm Street Hopkinton, MA 01748 (800) 242-4644

ERRS Region I Program CIH:	Kevin McMahon, MS, CIH I.T. Corporation 200 Horizon Center Blvd. Trenton, NJ 08691 (609) 588-6375
Local Lodging:	To be determined
Subcontractors:	To be determined

1.4 Site Safety Plan Acceptance Acknowledgment

The OSC or designated representative shall be responsible for ensuring that all individuals entering the EZ or CRZ have read the safety plan and have signed the Signature Page in Section 10.2. By signing the Signature Page, individuals are assuring that they recognize the hazards present in the EZ and CRZ, and the policies and procedures required to minimize exposure or adverse effects of these hazards. This signature page will be kept on file.

1.5 Daily Safety Meetings

Daily safety meetings will be held at the start of each shift to ensure that all personnel understand site conditions and operating procedures, to ensure that personal protective equipment (PPE) is being used correctly, and to address worker health and safety concerns. If work conditions should change during the course of a work shift, work will be stopped and all personnel will be informed of the change in site conditions.

1.6 Training Requirements

All personnel (including visitors) entering the EZ or CRZ must have completed training requirements for hazardous waste site work in accordance with 29 CFR 1910.120(e)(6), or be qualified by previous training or "experience" as prescribed in 29 CFR 1910.120(e)(9). Compliance and documentation of training requirements are the responsibility of each employer.

1.7 Medical Monitoring Requirements

All personnel (including visitors) entering the EZ or CRZ must have completed appropriate medical monitoring requirements required under 29 CFR 1910.120(f). Compliance and documentation of medical monitoring is the responsibility of each employer. If there are additional medical monitoring requirements for this site resulting from the nature of operations, evidence of compliance must also be included.

1.8 Fit Testing Requirements

All personnel (including visitors) entering the EZ or CRZ using a full-face negative pressure respirator must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.139 within the last 12 months. Compliance and documentation of fit testing requirements are the responsibility of each employer.

1.9 Hazard Communication Program Requirements

Each employer and its subcontractors that have employees reporting to the site shall inform the OSC or designated representative of all hazardous substances brought to the site and provide material safety data sheets (MSDSs) to the OSC. The OSC or designated representative shall be responsible for informing all site personnel and visitors of potential hazards. Each employer shall be responsible for providing other employers with information about labeling systems and precautionary measures. MSDSs from all employers shall be stored in one conspicuous location accessible to all site personnel and visitors. If the duration of site activities is greater than one week, each employer shall have a formal hazard communication plan in compliance with 29 CFR 1910.1200.

2.0 GENERAL OPERATIONS

2.1 Site Background

The American Glue and Resin site (the site) is located at 40 School Street in Middleton, Essex County, Massachusetts (see Figure 1 - Site Location Map). The coordinates for the property are latitude 42° 36' 51.47" North and longitude 71° 1' 28.27" West. The property is currently owned by a trustee organization for American Glue & Resin.

The site consists of 3.2 acres and is comprised of one single-story concrete block building of approximately 100,000 square feet, one single-story storage shed, a paved parking area and wetlands associated with Boston Brook which borders the site to the northwest. The general area surrounding the site consists primarily of a residential area with a commercial district located nearby. The topography of the site is generally flat with a slope to the northwest.

According to EPA file information, the site building was constructed in the 1940's and was used by a beverage company. An adhesive glue manufacturing operation began at the site in the 1970's and continued through the early 1990's, when adhesive manufacturing operations ceased and the company went out of business.

In September 1998, U.S. EPA and Massachusetts Department of Environmental Protection representatives conducted an inspection of the property. Approximately 500 labeled and unlabeled drums and containers were observed in the building, some of which appeared to be leaking or in poor condition. Label information from inventories

supplied by the property owner have identified drum contents that include solvents, flammable liquids and acids.

2.2 Scope of Work

The Scope of Work tasks identified in this health and safety plan (HASP) are generalized to familiarize the reader with the goals of the removal action. The removal action will consist of removing all drums and small containers from the building. The estimated duration of site activities is 6 weeks.

2.2.1 Scope of Work for the ERRS Contractor

- Mobilize to site and set up work zones and decontamination area.
- Procure equipment as needed.
- Restrict site access to allow authorized personnel only.
- Inventory hazardous materials present on site.
- Collect hazardous material samples for disposal analysis.
- Conduct hazardous categorization (HAZCAT) of drums, small containers, floor pits, vats, and trenches.
- Lab-pack all small containers containing hazardous materials.
- Over-pack drums containing hazardous materials as needed.
- Coordinate transportation and disposal of all hazardous materials at a CERCLA-approved facility.
- Demobilize all personnel and equipment upon completion of removal activities.
- Additional items will be added as needed in amendments sections.

2.2.2 Scope of Work for the START

- Provide the OSC with technical support during daily on-site activities.
- Assist the OSC with monitoring and documentation of site activities.
- Assist the OSC with the implementation of the site safety plan.
- Conduct multi-media sampling and air monitoring as needed.

3.0 SITE HAZARD ANALYSIS

This Site Hazard Analysis identifies the general and task-specific hazards associated with site-specific operations and presents an analysis of documented or potential chemical and physical hazards that exist at the site. Every effort will be made to reduce or eliminate these hazards. Those which cannot be eliminated will be guarded against by use of engineering controls and/or PPE. Task-specific personal protection levels can be found in Section 4.0.

It should be noted that the nature of removal work assignment may require the use of the following procedures/programs which will be included in section 9.0, "Standard Operating Guidelines", or as attachments to this HASP as applicable: these included, but are not limited to, Confined Space Entry Procedures, Emergency Response and Spill Containment Programs.

3.1 General Hazards

Lighting - Work areas must have adequate lighting for employees to see to work and identify hazards (5-foot candles minimum comparable to a single 75-100 watt bulb). The provisions outlined in 29 CFR 1910.120 (m) shall apply.

Electrical Power - All electrical power must have a ground fault circuit interrupter as part of the circuit. All equipment must be suitable and approved for the class of hazard. The provisions outlined in 29 CFR 1926, Subpart K, shall apply.

Cold Stress - When the temperature falls below 40°F, cold stress protocols shall be followed. Employees must be supplied with adequate clothing to maintain body temperature. Cold stress is discussed in detail in Section 3.7.1.

Eye Protection - All operations involving the potential for eye injury, splash, etc., shall have approved eye wash units locally available as per 29 CFR 1910.151 (c).

Fire Protection/Fire Prevention - Operations involving the potential for fire hazards shall be conducted in a manner as to minimize the risk. Non-sparking tools and fire extinguishers shall be used or available as appropriate. Sources of ignition shall be removed. When necessary, explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion. The provisions outlined in 29 CFR 1910 Subpart L, shall apply.

Utilities - Overhead and underground utility hazards shall be identified and or inspected prior to conducting operations involving potential contact. All underground utilities will be marked by the designated agency before any subsurface activity commences. Digsafe will be contacted by ERRS personnel prior to excavation activities, and information will be gleaned from the site owner as to the location of underground utilities and objects such as tanks, cesspools, wells, etc.

Drum Handling/Movement - The handling or movement of drums will be conducted in accordance with 29 CFR 1910.120 (j).

Heavy Equipment - Hazards associated with heavy equipment include equipment backing resulting in struck by or against the equipment, contact with above and underground utility lines, and high noise levels. To minimize accidents involving heavy equipment, all equipment must have operational back up alarms, personnel must

make eye-to-eye contact with the operator before approaching, utilize proper hand signals when communicating, and site personnel are to avoid equipment swing areas.

Structural Integrity - Hazards associated with the structural integrity of the site building may be present, although preliminary information indicates that the building is structurally sound. Structural integrity will be assessed prior to personnel entry.

3.2 General Safety Rules

- All personnel must proceed through the Contamination Reduction Corridor (CRC) to pass between the EZ and the Clean Zone (CZ). Specific work zones are given in Appendix C - Site Diagram/Work Zones.

- The "buddy system" will be used at all times by all field personnel in the EZ. No one is to perform field work alone. Maintain visual, voice or radio communication at all times.

- Eating, drinking, or smoking is permitted in designated areas only in the CZ, as referenced to the map.

- An emergency eye wash and deluge shower/spray will be located in the CRZ.

- Parking of nonessential vehicles inside of the work area will not be permitted, since safety lanes must not be obstructed.

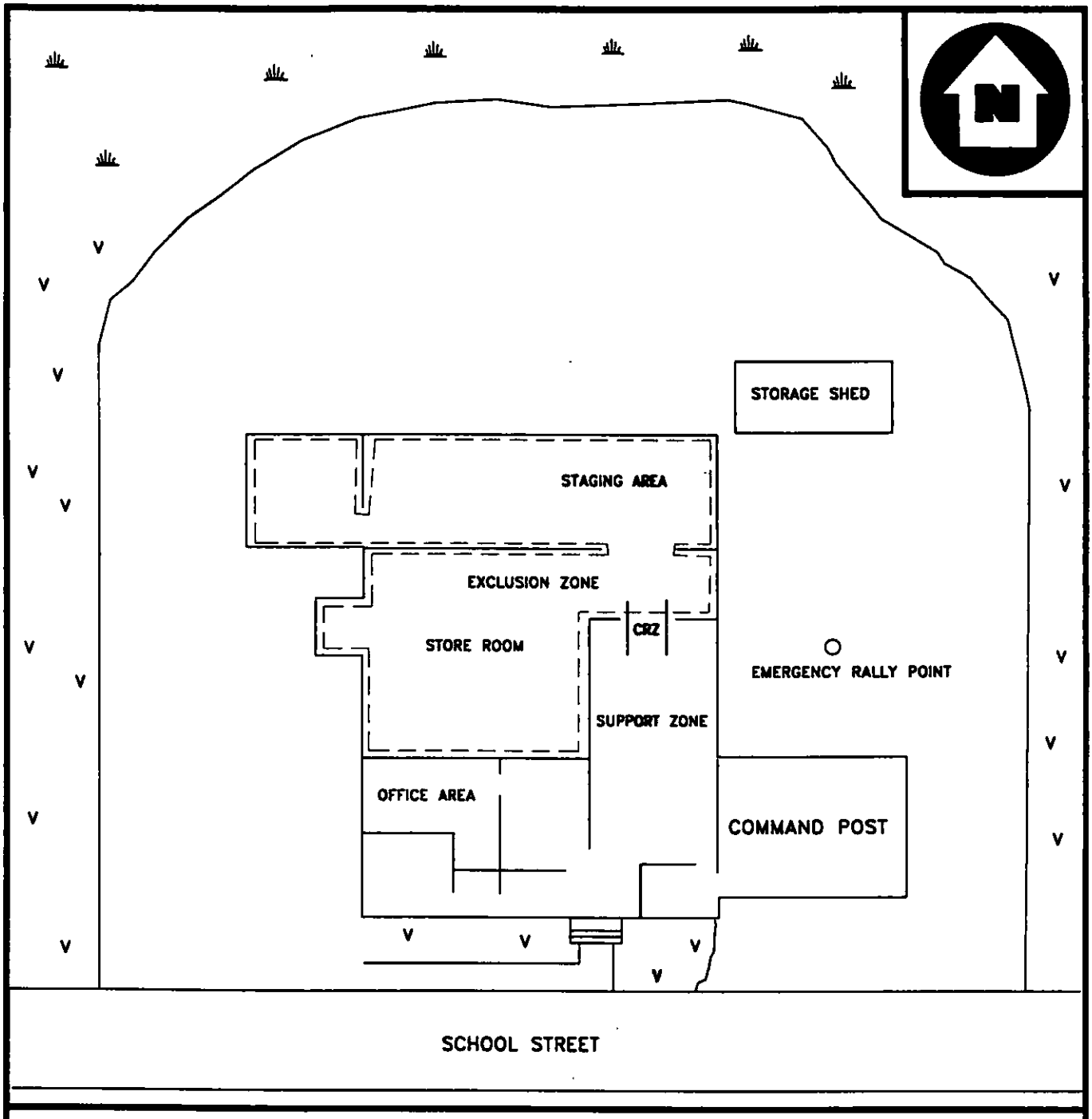
3.3 Specific Task Hazards and Control Measures

TASK	POTENTIAL HAZARD	HAZARD CONTROL MEASURES
Site Preparation Equipment/Facility Setup, Debris Clearing (clean zone)	1. Site Security	•Control unauthorized access to site using fencing and signs.
	2. Slips, Trips, Falls	• Clear walkways of equipment and debris. • Mark, identify, or barricade other obstructions. • Evaluate fall hazards above 4 feet; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 feet. • Use "heavy duty industrial" (type 1A) portable ladders . • Instal and inspect scaffolds according to manufacturer's requirements. • Only trained operators are permitted to use aerial lifts. • Tie off all straight/extension ladders or manually hold by co-worker. • Anchorage points for fall arrest systems must support at least 5,400 pounds for each worker.
	3. Handling Heavy Objects	• Observe proper lifting techniques. • Obey sensible lifting limits (60 lbs. max.). • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads.
	4. Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects. • Maintain all hand and power tools in a safe condition. • Keep safety guards in place during use.
	5. Low Ambient Temperature	• Monitor for cold stress (Section 3.7.1) as necessary.
	6. High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period).
	7. Struck By/Against Heavy Equipment	• Use reflective warning vests when exposed to vehicular traffic. • Avoid equipment swing areas. • Make eye contact with operators before approaching equipment. • Understand and review posted hand signals. • Wear hard hat, safety glasses with side shields, and steel-toed safety boots.

TASK	POTENTIAL HAZARD	HAZARD CONTROL MEASURES
	8. Insect/Snake/Animal Bites/Poisonous plants	Review injury potential and types of snakes with workers. • Avoid insect nests/likely habitats of snakes. • Emphasize the "Buddy System" where such injury potential exists. • Use insect repellant, wear PPE to protect against sting/bites injuries. • Wear PPE to avoid skin contact poisonous plants. • Identify and review poisonous plants with workers (see section 3.5). • Avoid both domesticate and non-domesticated animals and their likely habitat.
Site Preparation Equipment Facility Setup, Debris Clearing (CRZ/EZ)	**REFER TO POTENTIAL HAZARDS 1,2,3,4, 5,6,7, and 8. ADD POTENTIAL HAZARD 9. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
Site Preparation Equipment Facility Setup, Debris Clearing (CRZ/EZ) (continued)	9. Inhalation and Contact with Hazardous Substances	• Monitor work area for chemicals of concern prior to beginning work. • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present. • Conduct periodic monitoring of work areas as work proceeds. • Conduct dust suppression with water spray, if necessary. • Wear PPE to avoid skin contact with hazardous material or skin irritants.
Hazardous Material Inventory	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,8, AND 9. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
Container Sampling sampling of drums, small containers, process pits, vats, and trenches	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,8, AND 9. ADD POTENTIAL HAZARD 10. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
	10. Fire/Explosion	• Use spark proof tools. • Smoking is prohibited. • Post "No Smoking" signs. • Avoid container with crystallization around openings (shock sensitive). • Eliminate sources of ignition. • Provide ABC (or equivalent) fire extinguisher in all work and flammable storage areas. • Store combustible material away from flammables. • Separate flammables and oxidizers by 20 ft
Hazard Categorization (HAZCATing)	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,9, AND 10. ADD POTENTIAL HAZARD 11. USE CORRESPONDING HAZARD CONTROL MEASURES.**	

TASK	POTENTIAL HAZARD	HAZARD CONTROL MEASURES
	11. Uncontrolled Reactions/ /Fire/Expolsions During HAZCATTING	• Follow all procedures as provided in current edition of the ERRS Contractor Compatability Testing Manual. • Use required equipment for testing materials as required by the current edition of the ERRS Contractor Compatability Testing Manual. • Use only 5g sample for compatability testing. • Oxidizer and metals compounds are very reactive materials; it is recommended that these materials not be compatability tested when field analytical data is not available. • Keep samples and drums out of direct sunlight and heat. • Conduct HAZCAT testing within lab fume hood if possible. • Test atmosphere with combustible gas meter. • Store flammable liquids in well ventilated areas. • Prohibit storage, transfer of flammable liquids in plastic containers. • Prohibit smoking in the HAZCAT work area. • Post "No Smoking" signs. • Eliminate sources of ignition. • Provide ABC (or equivalent) fire extinguisher in all work and flammable storage areas. • Store combustible material away from flammables. • Store sample materials by compatible groups following identification.
Drum/Small Container Handling and Staging	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,6,7,8,9 AND 10. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
Drum/Small Container Labpacking, and Overpacking	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,6,7,9 AND 10. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
Desludging of Process Pits, Vats, and Trenches	**REFER TO POTENTIAL HAZARDS 2,3,4,5,7,8 AND 10. ADD POTENTIAL HAZARDS 12 AND 13. USE CORRESPONDING HAZARD CONTROL MEASURES**	

TASK	POTENTIAL HAZARD	HAZARD CONTROL MEASURES
	12. Flammable, Toxic, Oxygen Deficient Atmospheres	• Test vessel atmosphere for flammable/toxic vapors, and oxygen deficiency prior to entry or ignition producing activities. • Wear proper level of PPE for the type of atmospheric contaminants. • De-energize, lockout and tag all energized equipment. • Provide continuous forced air ventilation as required by 29 CFR 1910.146(c)(5). • Obtain Confined Space Entry Permit signed by equipment Supervisor/Safety Officer as required. • Provide written rescue plan, as required. • Review written rescue plan. • Review emergency procedures before work commences. • Review MS/DS information with entrants and safety observer as required. • Provide safety observer outside vessel, as required. • Use body harness, saafety belt with tripod winch for possible rescue, as required..
Desludging of Process Pits, Vats, and Trenches (continued)	13. Burns	• Use proper work gloves, face shield/safety goggles, and leather apron to protect workers from skin burns when operating welding, cutting, and burning and operating high pressure washers.
Waste Stream Transfer Load-Out of Containerized Hazardous Materials	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,6,7,9 AND 10. USE CORRESPONDING HAZARD CONTROL MEASURES.**	
Equipment Decontamination Heavy Equipment & Vehicles	**REFER TO POTENTIAL HAZARDS 1,2,3,4,5,6,7,9,10, AND 12. USE CORRESPONDING HAZARD CONTROL MEASURES.**	



CRZ CONTAMINATION REDUCTION ZONE

V GRASS AREA

WETLAND AREA

NOT TO SCALE

SITE DIAGRAM

AMERICAN GLUE & RESIN
40 SCHOOL STREET
MIDDLETON, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
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FIGURE 2

3.5 Biological Hazards

Bee, Wasp, and Insect Stings

Bee, wasp, and insect stings are usually nuisances (localized swelling, itching, and minor pain) that can be handled by first-aid treatment. The greatest hazard and most-common cause of fatalities from bees, wasps and insects, is from a sensitivity reaction (acute allergic reactions). Shocks due to stings can lead to severe reactions in the circulatory, respiratory, and central nervous systems, which also can result in death. Two out of ten individuals are susceptible to bee sting allergic reactions.

If an assigned employee has a history of allergic reactions to stings, they will be required to have their prescribed treatment with them, and will notify site Health and Safety personnel and the OSC of the location and prescribed treatment of the antidote. All stings or bites will be taken seriously. Anyone stung or bitten will be required to stop work while that person is observed for signs of severe swelling, shortness of breath, nausea, or shock. Additionally, anyone stung or bitten will be required to notify site Health and Safety personnel and the OSC immediately. If there is any doubt, medical attention will be obtained.

First Aid

a. Minor stings and bites reactions
    1. Cold applications.
    2. Soothing lotions, such as dibucaine ointment (First aid Kits).

b. Severe life-threatening reactions (anaphylactic shock) to stings and bites
    1. Recognition of warning signs:
        - welts forming over majority of body (hives),
        - development of asthmatic attacks with respiratory wheezing,
        - lethargic/no energy,
        - onset of symptoms of shock.
    2. If person has a history of allergic reaction to stings or bites, follow prescribed treatment - usually epinephrine injections.
    3. Monitor vital signs and transport to emergency medical facilities for treatment.

Poison Ivy *(Rhus radicans)*

Poison ivy may be found at the site. It is highly recommended that all personnel that may enter into an area found to contain poison ivy, wear a minimum of a Tyvek coverall or equivalent to avoid skin contact.

Contact with Poisonous Plants

1. Characteristic Reactions

   The majority of skin reactions following contact with offending plants are allergic in nature and are characterized by:

   a. General symptoms of a headache and fever
   b. Itching
   c. Redness
   d. Rash

Some of the most common and most severe allergic reactions result from contact with plants of the poison ivy group including poison ivy and poison sumac. Such plants produce severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim also may develop a high fever and may be very ill. Ordinarily, the rash begins within a few hours after exposure, but may be delayed for 24 to 48 hours.

2. Distinguishing Features of Poison Ivy Group Plants

The most distinctive features of poison ivy are their leaves (see diagram on the following page), which are composed of three leaflets. The plant also has greenish-white flowers and berries that grow in clusters.

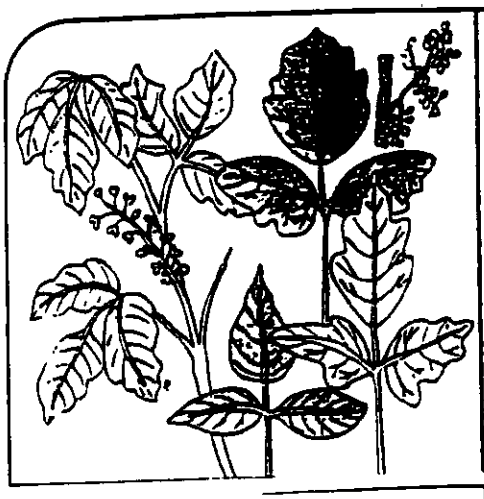
Poison Sumac grows as a woody shrub or a small tree, at heights ranging from 5 to 25 feet tall.

3. First Aid

   a. Remove contaminated clothing; wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol.

   b. Apply calamine, cortisone or other soothing skin lotion if the rash is mild.

   c. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.



COMMON POISON IVY
(RHUS RADICANS)

- Grows as a small plant, a vine, and a shrub.
- Grows everywhere in the United States except California and parts of adjacent states. Eastern oak leaf poison ivy is one of its varieties.
- Leaves always consist of three glossy leaflets.
- Also known as three-leaf ivy, poison creeper, climbing sumac, poison oak, markweed, picry, and mercury.

POISON SUMAC
(RHUS VERNIX)

- Grows as a woody shrub or small tree from 5 to 25 feet tall.
- Grows in most of eastern third of United States.
- Also known as swamp sumac, poison elder, poison ash, poison dogwood, and thunderwood.

Ticks

Heavily vegetated areas of the site may have ticks (see tick diagram on the following page). It is highly recommended that all personnel walking through such areas wear a minimum of a Tyvek coverall or equivalent and latex boot covers. The ticks will stand out against the light colors. A tick repellent or insect repellent is also suggested.

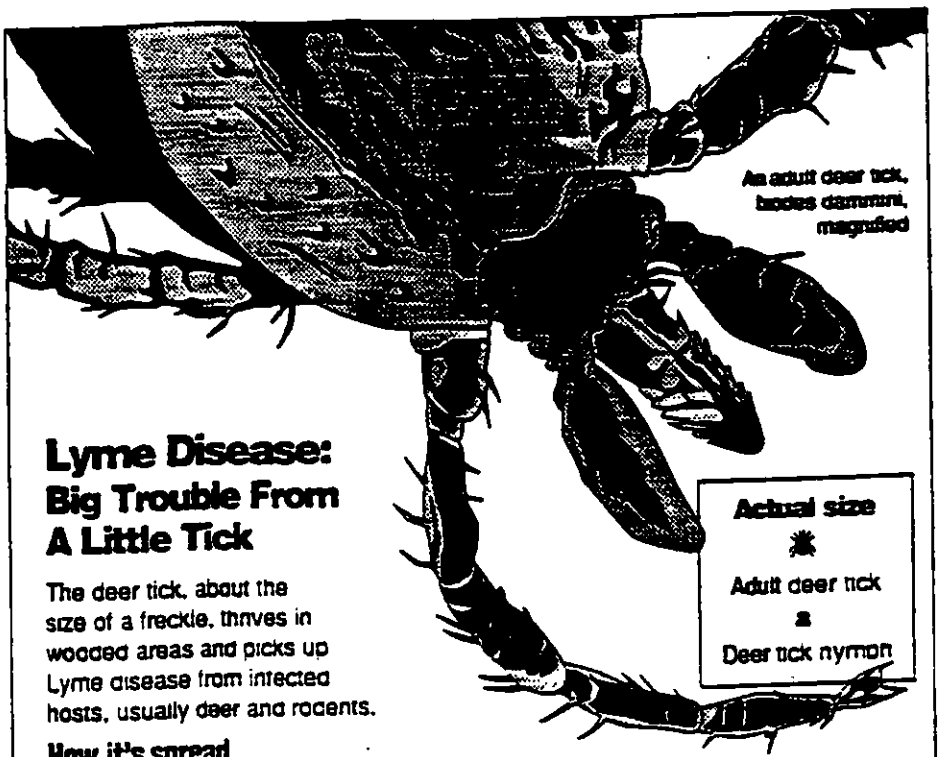
Ticks can transmit germs of several diseases, including Lyme disease and Rocky Mountain spotted fever, a disease that occurs in the eastern portion of the United States as well as the western portion. Ticks adhere tenaciously to the skin or scalp. There is some evidence that the longer an infected tick remains attached, the greater is the chance that it will transmit disease.

First Aid

a. Cover the tick with heavy oil (mineral, salad, or machine) to close its breathing pores. The tick may disengage at once, if not, allow the oil to remain in place for a half hour. Then carefully (slowly and gently) remove the tick with tweezers; taking care that all parts are removed. If possible, do not kill the tick before it has been removed.

b. With soap and water, thoroughly but gently scrub the area from which the tick has been removed, because disease germs may be present on the skin, also wipe the bite area with an antiseptic.

c. If you have been bitten, place the tick in a jar labeled with the date, location of the bite and location acquired.



An adult deer tick, Ixodes dammini, magnified

Lyme Disease: Big Trouble From A Little Tick

The deer tick, about the size of a freckle, thrives in wooded areas and picks up Lyme disease from infected hosts, usually deer and rodents.

Actual size

Adult deer tick

Deer tick nymph

How it's spread

Tick attaches itself to a person, feasts on blood for 12 to 24 hours before injecting a microscopic corkscrew-shaped organism called a spirochete into a capillary. Spirochetes, not carried by all ticks, cause the disease. Peak months for infection are May, August.

Symptoms of the disease

Early stages: Fever, headache, extreme fatigue, stiff neck. A characteristic rash may develop: a pale area at least 2 inches wide surrounded by a reddened border.

Advanced stages: Visual disturbances, facial paralysis, tingling and numbness, arthritis, irregular heartbeat and seizures.

How to reduce the risk of infection

- Wear long pants, long- sleeved shirts to cover skin; tuck pants into socks, tape the tops; tuck shirt into pants.
- Wear light-colored clothing to spot ticks more easily.
- Inspect yourself often for ticks while you're outside — the longer a tick stays attached, the greater the likelihood that it will transmit infection; check children each evening.
- Use insect repellent with DEET on open skin, clothing.
- Inspect pets often; get tick repellents from your vet.
- Mow lawns, cut brush back from paths and house; remove wood piles that attract mice.
- To remove a tick, grasp it with tweezers close to the skin and pull gently upward; be sure to remove the insect's head.

SOURCE: Centers for Disease Control, Chicago Tribune, Harvard Medical School Health Letter, Health Watch, Illinois Department of Public Health, news reports, Knight-Ridder Tribune Graphics

Press graphic/Tim Faherty

3.6 *Chemical Hazards*

Analytical data and background information has indicated that the following substances are, or may be, present at the site. Detailed hazard information for each substance can be found in Appendix C.

CONTAMINANT (synonym)	TLV/PEL (ppm)	IDLH (ppm)	IP (eV)	PHYSICAL CHARACTERISTICS	ROUTE OF EXPOSURE	SYMPTOMS	FIRST AID	BP (°F)	FLASH POINT (°F)	LEL (%)	VAPOR PRESSURE (mm Hg)	EXTINGUISHING METHODS	FLAMMABILITY (NFPA SYSTEM)
Acetone	250/1,000	2,500	9.69	Colorless liquid with a fragrant mint-like odor	Inh Ing Con	Irrit eyes, nose, throat; head, dizz, CNS depres; derm	Eye Skin Breath Swallow	133	0	2 5	180	Alcohol foam Dry Chemical C02	Class 1B Flammable Liquid (3)
Methyl Ethyl Ketone (2-Butanone)	200/200 ST TLV 300	3,000	9.54	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor	Inh Ing Con	Irrit eyes, nose, skin; head, dizz; vomit; derm	Eye Skin Breath Swallow	175	16	1.4	78	Alcohol Foam Dry Chemical CO2	Class 1B Flammable Liquid (3)
Phosphoric Acid	1/1 mg/m3 ST TLV 3 mg/m3	1,000 mg/m3	NA	Thick, odorless, colorless, crystalline solid (often used in aqueous solution)	Inh Ing Con	Irrit upper resp tract, eyes, skin; burns skin, eyes; derm	Eye Skin Breath Swallow	415	NA	NA	0 03	Appropriate For Surrounding Fire	Noncombustible Solid (0)
Toluene (toluol, phenyl methane, methyl benzene)	100/200 ST 150 OSHA ceiling 300 (500 for 10 min. max peak)	500	8.82	Colorless liquid with a sweet, pungent, benzene-like odor	Inh Ing Con Abs	Fig, weak, conf, euph, dizz, head; dilated pupils, lac; ner, musc fig, insom, pares; derm; liver, kidney damage, irrit eyes, nose	Eye Skin Breath Swallow	232	40	1.1	21	Alcohol Foam Dry Chemical CO2	Class 1B Flammable Liquid (3)

KEY TO SYMBOLS AND ABBREVIATIONS

GENERAL

NA - Information not applicable
na - Information not available
CA - Carcinogenic
TLV - Threshold Limit Value
PEL - Permissible Exposure Limit
IP - Ionization Potential
BP - Boiling Point
LEL - Lower Explosive Limit
ppm - Parts per million
eV - Electron volt
atm - atmosphere
IDLH - Immediately Dangerous to Life or Health
mg/m3 - milligrams per cubic meter
ST - Short-Term

ROUTE OF EXPOSURE

Inh - Inhalation
Ing - Ingestion
Abs - Skin Absorption
Con - Skin and Eye Contact

FLAMMABILITY (NFPA SYSTEM)

0 - Material will not burn.
1 - Material must be preheated before ignition can occur.
2 - Material must be moderately heated or exposed to relatively high ambient temperature before ignition can occur.
3 - Material can be ignited under almost all ambient temperature conditions
4 - Material will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or is readily dispersed in air and will burn readily.

FIRST AID

Eye - Irrig immed
Skin - Water flush immed
Breath - Resp support
Swallow - Medical attention immed

- For additional codes refer to the following pages

SYMPTOMS - See abbreviations on following pages

ABBREVIATIONS FOR SYMPTOMS OF ACUTE EXPOSURE

abdom - abdominal
album - albuminuria
anem - anemia
anes - anesthesia
anor - anorexia
anos - anosmia
ANS - automatic nervous system
apat - apathy
appre - apprehension
arrhy - arrhythmias
asphy - asphyxia
asth - asthma
biliru - bilirubinuria
blur - blurred
breath - breathing
bron - bronchitis
bronspas - bronchospasm
BUN - blood urea nitrogen
ca - cancer
cachexia - severe generalized weakness, emaciation
[CARC] - carcinogenic/carcinogen
card - cardiac
cere - cerebral
chol - cholinesterase
chor - chorea
cirr - cirrhosis
CNS - central nervous system
coll - collapse
conf - confusion
conj - conjunctivitis
constip - constipation
constric - constriction
convuls - convulsions
cor pulmonale - acute right heart strain or chronic right ventricular hypertrophy
corn - cornea
CVS - cardiovascular system
cyan - cyanosis
defat - defatting
deg - degeneration
dent - dental
depres - depressant/depression
derm - dermatitis
diarr - diarrhea
dil - dilated
dist - disturbance
dizz - dizziness
drow - drowsiness
dys - dysuria
dysp - dyspnea
dysart - dysarthria
ecz - eczema
emphy - emphysema
enl - enlargement
eosin - eosinophilia
epis - epistaxis
epit - epistaxis
equi - equilibrium
ery chol - erthrocyte cholinesterase
eryt - erythema
euph - euphoria
extrex - extremities
fasc - fasciculation
fib - fibrosis
fibrl - fibrillation
frost - frostbite
ftg - fatigue
fvr - fever
gasp - gasping
GI - gastrointestinal
gidd - giddiness
glau - glaucoma
glu - glucose
halu - hallucinations
head - headache
hemat - hematoma
hemato - hematoglobinuria
hemorr - hemorrhage
hep - hepatic
hyper - hyperemia
hypox - hypoxemia
ict - icterus
inco - incoordination
inflamm - inflammation
inj - injury
insom - insomnia
intox - intoxication
irrit - irritation
irrity - irritability
jaun - jaundice
kera - keratitis
kid - kidney
lab - labored
lac - lacrimation
lar - laryngeal
lass - lassitude
leucyt - leucocytosis
leuk - leukemia
leupen - leukopenia
li-head - lightheadedness
liv - liver
lo-ap - appetite
low-wgt - weight loss
lymp - lymphocytosis
mal - malaise
malnut - malnutrition
monocy - monocytosis
muc memb - mucous membrane
musc - muscle
myo - myotonia
narc - narcosis
nas - nose/nasal
nau - nausea
nec - necrosis
neph - nephritis
ner - nervousness
neur - neurologic
numb - numbness
opac - opacity
pal - pallor
palp - palpitations
para - paralysis
pares - paresthesia
paresis - incomplete loss of muscular power; weakness of a limb
parox - paroxysm
perf - perforation
peri neur - peripheral neuritis
periorb - periorbital
phar - pharyngeal
photo - photophobia
pig - pigmentation
plas - plasma
pleur - pleurisy
pneu - pneumonia
pneuitis - pneuitis
PNS - peripheral nervous system
polyneur - polyneuropathy
pros - prostration
prot - proteinuria
pyspec - psychialopecia
pulm - pulmonary
pulsus altenans occur - a pulse pattern in which beats at regular intervals, but with alternating weak and strong beats
pup - pupil
RBC - red blood cell
resp - respiratory
resp ar - respiratory arrest
rester - restrostrenal
rhin - rhinorrhea
salv - salivation
scotoma - an area of absent or depressed vision in the visual field
sens - sensitization
sez - seizure
sleep - sleepiness
sneez - sneezing
som - somnolence
spas - spasm
strabismus - abnormality of the eyes visual axes do not meet at the desired point
subs - substernal
sweat - sweating
swell - swelling
tacar - tachycardia
temp - temperature
tend - tenderness
trachbronc - tracheobronchitis
vasconst - vasoconstriction
venfib - ventricular fibrillation
verti - vertigo
vesic - vesiculation
vis dist - visual disturbance
vomit - vomiting
weak - weakness
wheez - wheezing

CODES FOR FIRST AID TREATMENT

EYE

Irr immed	If chemical comes in contact with the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
Irr immed (15 min)	If this chemical comes in contact with the eyes, immediately wash the eyes with large amounts of water and continue flushing for 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
r promptly	If this chemical comes in contact with the eyes, promptly wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention if any discomfort continues. Contact lenses should not be worn when working with this chemical.
Medical attention	Self-explanatory

SKIN

t off solid; ater flush	If this solid chemical comes in contact with the skin, dust it off immediately and then flush the contaminated skin with water. If this chemical, or liquids containing this chemical, penetrate through the clothing, promptly remove the clothing and flush the skin with water. Get medical attention immediately.
Medical attention or frostbite	If this chemical comes in contact with the skin or mouth, stop the exposure immediately. If frostbite has occurred, get medical attention.
lten: flush med; sol/ liq wash	If this molten chemical comes in contact with the skin,immediately flush the skin with large amounts of water. Get medical attention immediately. If this chemical, or liquids containing this chemical, contacts the skin, promptly wash the contaminated skin with soap and water. If this chemical, or liquids containing this chemical, penetrates through the clothing, immediately remove the clothing and wash the skin with soap and water. If irritation persists after washing, get medical attention.
Petro product rinse	If this chemical or strongconcentrations of this chemical's vapors comes in contact with the skin, immediately rinse the contaminated skin with kerosene or similar petroleum products, if readily available, then wash the skin with soap and water. If this liquid chemical or strong concentrations of this chemical's vapors penetrate through the clothing, immediately remove the clothing and rinse the skin with kerosene or similar petroleum products, if readily available, then wash the skin with soap and water. Get medical attention immediately.
Soap flush immed	If this chemical comes in contact with the skin, immediately flush the contaminated skin with soap and water. If this chemical penetrates through the clothing, and flush skin with water. If irritation persists after washing, get medical attention.
Soap flush promptly	If this chemical comes in contact with the skin, promptly flush the contaminated skin with soap and water. If this chemical penetrates through clothing, promptly remove the clothing and flush the skin with water. If irritation persists after washing, get medical attention.
Soap promptly/ flush immed	If this solid chemical/liquids containing this chemical,comes incontact with the skin, promptly wash the contaminated skin with soap and water. If irritation persists after washing, get medical attention. If this chemical contacts the skin or non-impervious clothing, immediately flush the affected area with large amounts of water to remove heat. Get medical attention immediately.
Soap wash	If this chemical comes in contact with the skin, wash the contaminated skin with soap and water.
Soap wash immed	If this chemical comes in contact with the skin, immediately wash the contaminated skin with soap and water. If this chemical penetrates through the clothing, immed-iately remove the clothing, wash the skin with soap and water, get medical attention promptly.
Soap wash promptly	If this chemical comes in contact with the skin, promptly wash the contaminated skin with soap and water. If this chemical penetrates through the clothing, promptly remove the clothing and flush skin with water promptly. If irritation persists after washing, get medical attention.
Water wash immed	If this chemical comes in contact with the skin, promptly wash the contaminated skin with water. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with water. If irritation persists after washing, get medical attention.

BREATH

Art resp	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.
Fresh air	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. Other measures are usually unnecessary.
Fresh air; 100% O_2	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. When breathing is difficult, properly trained personnel may assist the affected person by administering 1005 oxygen. Keep the affected person warm and at rest. Get medical attention as soon as possible.

SWALLOW

Medical immed	If this chemical has been swallowed get medical attention immediately.

3.7 Physiological Hazards

3.7.1 Cold Stress

When the temperature falls below 40°F, cold stress protocols shall be followed. It is the responsibility of each employer to ensure that employees are supplied with adequate clothing.

Cold stress effects (Hypothermia and Frostbite) can affect anyone who is exposed to cold and/or wind for a prolonged time. Hypothermia involves cooling of the whole body to a subnormal temperature caused by exposure to cold, wind and/or rain, or by immersion in cold water. Under these conditions, which may easily occur when ambient air or water temperatures are well above freezing, the body begins to lose its essential heat more rapidly than it is able to replace it. If such conditions are not reversed and the body's core temperature is not returned to normal, the body's chemical reactions will be slowed and serious impairment or death may result.

The first parts of the body effected are the hands and feet. If a loss in body heat continues, shivering begins. This is the body's mechanism to produce more heat, and it acts as an early warning sign of hypothermia. As heat loss increases, speech difficulty may occur along with a loss of manual dexterity, forgetfulness, or collapse. More severe symptoms which may occur include severe shaking of the muscles in an arm or leg, uncontrollable shivering, memory lapse, incoherence, irregular breathing, and low blood pressure.

Frostbite is the actual freezing of the tissues. It is caused by ice crystals forming in the fluids and soft tissues of the skin. Effects of frostbite are usually not life-threatening, but they can include scarring, tissue loss, disfigurement or the need for amputation. The effects are usually more severe if the area is thawed and then refreezes. Frostbite usually affects small areas such as the nose, the cheeks, the ears, the fingers and the toes. Smoking has been demonstrated to increase a person's susceptibility to getting frostbite because smoking constricts blood vessels and limits blood supply to the arms and legs.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill describes the cooling effect of moving air in combination with low temperature. For instance, 10 degrees Fahrenheit and a wind speed of 15 miles per hour (mph) is equivalent in chilling effect to still air at -18 degrees Fahrenheit.

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. It should be noted that water conducts heat away from the body 25 to 40 times faster than air. Such a rate applies not only to situations in which persons are totally immersed in water as a result of an accident, but also to situations in which perspiration, rain and mist are trapped against the body by clothing or footwear. Thus, the body cools suddenly and dramatically when chemical protective equipment is removed if the clothing underneath is perspiration-soaked.

1. Prevention

Some measures which can significantly reduce the incidence of hypothermia and/or frostbite include:

a. Limit exposure. Limit exposure to cold temperatures, rain and wind by rewarming frequently in a heated shelter or vehicle.

b. Proper clothing. Wear several layers of insulating clothing, including but not limited to thermal undergarments, socks, gloves, and headcovering. If condition warrant wear windproof or waterproof outer garments to reduce exposure and heat loss. Articles of clothing should not be so tight that they restrict circulation.

c. Strength and Energy level. Rest before any possible exposure to ensure maximum strength. Eat a well balance diet to maintain a high energy level.

d. Adjustment of the work schedule. When practicable, the most labor-intensive tasks should be carried out during the coolest part of the day.

e. Work in pairs. Any activity that will take more than a couple of minutes should not be accomplished alone. In any circumstance, no person will be alone in areas requiring protective clothing without notifying another.

f. Awareness. Awareness, recognizing and early reaction to the signs and symptoms of cold stress will reduce severity of the injury.

NOTE: Frostbite can be prevented by limiting exposure to extreme cold, avoiding personal practices that may contribute to the freezing of tissue, wearing proper protective covering, and recognizing early symptoms of frostbite. The danger of frostbite is increased if a person is tired or the body's resistance is low from a recent illness. When outside in cold air, keep moving; exercise fingers and toes if necessary, but avoid overexertion.

2. Recognition and Treatment

a. HYPOTHERMIA - LIFE THREATENING

Signs	Symptoms
Lack of Shivering	Weakness
Loss of coordination	Difficulty performing tasks
Loss of consciousness	Making poor decisions
Breathing and heartbeat slow or absent	Cool and wet, or cold environment

Note: Water, wet clothing and wind accelerate heat loss

Treatment

1. Prevent further heat loss, shelter victim from wind and water in a warm enclosure.

2. Remove wet or frozen clothing and anything that is constricting. Replace with dry clothing.

3. Rewarm the victim rapidly by wrapping in warm blankets or by placing in a tub of water that is warm, but not hot to the hand or forearm; dry thoroughly.

4. If the victim is conscious, give warm liquids (no alcohol, no caffeine) to drink.

5. If moderate to severe signs and symptoms, seek medical assistance for rewarming procedures.

b. FROSTNIP - Cooling of tissues - Not Immediately Life Threatening
FROSTBITE - Freezing of body tissues

Signs	Symptoms
Frostnip	*Frostnip*
Gray or yellowish patches of skin. Tissues soft and resilient.	Little or no pain as it develops.
Frostbite	*Frostbite*
Tissues pale, cold, solid, woodlike. Tissues not resilient, Grayish patches	Lack of sensation

Treatment

1. Bring the victim into a warm, sheltered enclosure and cover with a blanket.

2. Give the victim a warm, non-alcoholic drink.

3. Apply or place the affected area in warm (not hot) water.

4. The victim should exercise the affected areas after warming is complete, except if the feet are involved, then the victim should not walk.

5. If moderate to severe signs and symptoms, seek medical assistance.

c. CHILBLAIN - Exposurre to cold temperatures
IMMERSION FOOT (TRENCH FOOT) - Exposure to wet conditions

Signs	Symptoms
Chilblain	*Chilblain*
Swollen, red skin.	Tender, hot skin, usually accompanied by itching.

Treatment

1. Waarm affected area with direct body heat. Do not massage or rub. Do nott wet area or rub with snow or ice. Do not expose affected area to open fire,stove or any other intense heat source.

Signs	Symptoms
Immersion Foot	*Immersion Foot*
Cold numb feet may progress to hot with shooting pains.	Possible swelling, redness and bleeding.

Treatment

1. Rewarm feet by exposing them to warm air. Do not massage, rub moisten or expose affected area to extreme heat sources.

3.7.2 Cold Stress Monitoring and Preventative Actions

Typical cold stress monitoring procedures are included in the table below.

Temperature	Preventative Action
< 61° F	Use thermometer to measure ambient temperature.
< 40° F	Cold weather protective clothing available; check core body temperature at breaks using oral or ear canal thermometer. Maintain core body temperature above 96.8° F to avoid hypothermia.
< 30° F	Record ambient temperatures and wind speed every 4 hours; compare to wind chill chart when below 19.4° F.
< 19° F	Provide and use heated warming shelters for work breaks and when cold stress symptoms appear.
< 10° F	Constant observation of workers, i.e. "buddy system"; rest in heated shelters; (see work-rest schedule) dry clothing available for change outs; acclimate new workers.
< 0° F > 5 mph winds	Obtain medical certification for workers subject to hypothermia risk.

3.7.3 Work/Warm-up Schedule for Four Hour Shift

Air Temperature - Sunny Sky °F	No Noticible Wind		5 mph wind		10 mph wind		15 mph wind		20 mph wind	
	Max. Work Period	No. Of Breaks	Max. Work Period	No. Of Breaks	Max. Work Period	No. Of Breaks	Max. Work Period	No. Of Breaks	Max. Work Period	No. Of Breaks
- 15 to -19	Normal	1	Normal	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	Normal	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-25 to -29	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work to cease.	
-30 to -34	55 min.	3	40 min.	4	30 min.	5	Non-emergency work to cease.			
-35 to -39	40 min.	4	30 min.	5	Non-emergency work to cease.					
-40 to -44	30 min.	5	Non-emergency work to cease.							
≤ -45	Non-emergency work to cease.									

Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature*

Estimated Wind Speed (mph)	Actual Temperature Reading (°F)											
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER** In < 1 hour with dry skin. Maximum danger of false sense of security.				**INCREASING DANGER** Danger from freezing of exposed flesh within 1 minute.			**GREAT DANGER** Flesh may freeze within 30 seconds.				
Trenchfoot and immersion foot may occur at any point on this chart.												

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

4.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following table provides a description of the minimum levels of PPE and protective clothing required for particular work activities at the site. This table also summarizes air monitoring requirements for particular work activities. No activities requiring Level A protection is anticipated at this site.

Work Activity	Initial PPE Level	Protective Clothing	Air Monitoring
Site Preparation Equipment/Facility Setup, Debris Clearing	Level D (CZ)	Hard Hat Safety Glasses Steel-Toed Work Boots Cotton Work Gloves	Gases and Vapors LEL/O_2 Radiation
Site Preparation Equipment/Facility Setup, Debris Clearing	Modified Level D (CRZ/EZ)	Hard Hat Safety Glasses Tyvek Coveralls Latex Boot Covers Surgical Inner Gloves Nitrile Outer Gloves Steel-toed Work Boots Cotton Work Gloves	Gases and Vapors LEL/O_2 Radiation Particulates
Hazardous Material Inventory	Level C	Hard Hat Tyvek Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots APR w/ GMC-P100	Gases and Vapors Radiation LEL/O_2
Container Sampling Sampling of drums, small containers, process pits and vats	Level B	Hard Hat Splash Shield Saranex Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots SCBA or airline	Gases and Vapors Radiation LEL/O_2 Particulates
Hazard Categorization (HAZCATing)	Level B	Hard Hat Splash Shield Saranex Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots SCBA or airline	Gases and Vapors LEL/O_2

Work Activity	Initial PPE Level	Protective Clothing	Air Monitoring
Hazard Categorization (HAZCATing) (cont;)	Modified Level D*	Hard Hat Safety Glasses Polycoated Tyvek Coveralls Latex Boot Covers Surgical Inner Gloves Nitrile Outer Gloves Steel-toed Work Boots Cotton Work Gloves	Gases and Vapors LEL/O_2
Drum/Small Container Handling and Staging	Level B	Hard Hat Splash Shield Saranex Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots SCBA or airline	Gases and Vapors LEL/O_2
	Modified Level D**	Hard Hat Safety Glasses Polycoated Tyvek Coveralls Latex Boot Covers Surgical Inner Gloves Nitrile Outer Gloves Steel-toed Work Boots Cotton Work Gloves	Gases and Vapors LEL/O_2
Drum/Small Container Labpacking, and Overpacking	Level B	Hard Hat Splash Shield Saranex Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots SCBA or airline	Gases and Vapors LEL/O_2
	Level C**	Hard Hat Polycoated Tyvek Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots APR w/ GMC-P100	Gases and Vapors LEL/O_2

Work Activity	Initial PPE Level	Protective Clothing	Air Monitoring
Desludging of Process Pits, Vats, and Trenches	Level C***	Hard Hat Polycoated Tyvek Coveralls Latex Boot Covers Latex Inner Gloves Nitrile Outer Gloves Steel-Toed Work Boots APR w/ GMC-P100	Gases and Vapors Radiation LEL/O_2 Particulates
Waste Stream Transfer Load-Out of Containerized Hazardous Materials	Modified Level D	Hard Hat Safety Glasses Tyvek Coveralls Latex Boot Covers Surgical Inner Gloves Nitrile Outer Gloves Steel-toed Work Boots Cotton Work Gloves	Gases and Vapors LEL/O_2
Equipment Decontamination Heavy Equipment and Vehicles	Modified Level D	Hard Hat Splash Shield Tyvek Coveralls Latex Boot Covers Surgical Inner Gloves Nitrile Outer Gloves Steel-toed Work Boots	Gases and Vapors

* Utilizing portable fume hood.
** If drums/small containers are in good condition - closed and free of corrosion and leaks.
*** Does not include work requiring confined space entry.

Respiratory protective equipment shall be National Institute for Occupational Safety and Health (NIOSH) approved and use shall conform to 29 CFR Part 1910.134 (b) - requirements. Each employer shall maintain a written respirator program detailing selection, use, cleaning, maintenance, and storage of respiratory protective equipment. When respirator use is required, beards or other facial hair that interferes with respirator fit will preclude admission to the EZ.

5.0 AIR MONITORING

According to 29 CFR 1910.120 (h), air monitoring objectives may include any of the following:

- Identify and quantify airborne contaminants onsite and offsite.
- Track changes in air contaminants that occur over the lifetime of the removal action.
- Ensure proper selection of work practices and engineering controls.
- Determine the adequate level of worker protection.
- Assist in defining work zones.

- Identify additional medical monitoring needs in any given area of the site.

5.1 General Requirements

Air monitoring using direct reading instruments shall be performed:

- Upon initial entry to rule out IDLH conditions.
- When the possibility of an IDLH condition or flammable atmosphere has developed.
- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated.
- When employees are handling leaking drums or containers or working in areas with obvious liquid contamination.
- During confined space work.
- When prescribed by other applicable regulations.

Air monitoring will consist at a minimum of the criteria listed in Section 5.2. All air monitoring data will be documented and submitted to the OSC, and made available in the command post (CP) site files for review by all interested persons. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

Additional air monitoring may be required if and incident arises which results in the release of hazardous substances. This sampling data will be utilized to assess site conditions and to design further removal action objectives.

5.2 Site Specific Requirements

Compounds Instrument	To Detect	Comments Frequency	Action Level
Combustible Gas Indicator (CGI)	Explosive/Flammable Atmospheres	Initial, and as deemed necessary by the OSC.	<10% LEL, Continue. 10 - 25% LEL, Continue with increased air monitoring. >25% LEL, Exit area immediately.
Oxygen Meter	• Oxygen %[1] • Flammability risk. • Sufficient O_2 for accurate CGI readings.	Initial, and as deemed necessary by the OSC.	<19.5 exit (SCBA required; CGI not valid)[1]. 19.5-21% Continue work.[1] 21%-25% Continue with caution.[1] >25% Cease operations.[1]
Radiation Meter	Radiation	Initial, and as deemed necessary by the OSC.	>3 X bkgd and <1 mR/hr: Proceed with caution; consult health physicist. >1 mR/hr: Leave immediate area of source. Work may continue under the direction of a health physicist.

Compounds Instrument	To Detect	Comments Frequency	Action Level
PID/FID	Total volatile gases and vapors. (Note: PIDs can also detect inorganics)	Initial, and as deemed necessary by the OSC.	Background: Level D. >Background to 5 units: Level C. >5 to 500 units: Level B. > 500 units: evacuate area

[1] Any O_2 concentrations above or below 20.8% to be reported to OSC for determination of cause of variance before work continues.

6.0 SITE CONTROL

The primary purpose for site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. At the end of each workday, the site will be secured to prevent unauthorized entry.

6.1 Designation of Work Zones at the Site

The entire site will be divided into three zones:

a. The EZ: the area which is known to be or has the potential for becoming, contaminated by the work performed.

b. The CRZ: the area between the EZ and the CZ. The CRC will be located within the CRZ and serve as the area within which personnel and equipment will be decontaminated. This corridor will be the normal entry and exit path for the EZ.

c. The CZ: the area which is not contaminated.

As work progresses on site, the OSC may determine that an area previously designated an EZ is no longer so classified.

Specific layout of these zones (to be determined by the OSC prior to and during site mobilization):

6.1.1 Exclusion Zone

The EZ is that portion of the site where contamination is present, including staging areas.

6.1.2 Contamination Reduction Zone

The CRZ and CRC will be strategically located just before the actual removal action begins. Their location shall take into

consideration site characteristics such as wind direction, points of access, and site space constraints.

6.1.3 Clean Zone

The CZ will include all areas outside the CRZ and the EZ until such time during the removal action as these zones are declared clean by the OSC.

A diagram of the work zones for this site is provided in Appendix C. The site diagram will be kept up to date by the safety monitor as specific work zones are established and modified.

6.2 Security Procedures

Security will not be maintained by a guard service during non-working hours. The following procedures will be implemented to ensure that site security is maintained:

- High visibility fencing will be maintained around all site hazards during the removal action.
- All equipment and supplies will be secured either within the CZ or inside a secure area.
- It is recommended that personal belongings and "high-theft" items (i.e., computers, air monitoring instruments, etc.) are removed from the site at the end of each work day.

7.0 DECONTAMINATION PROCEDURES

7.1 Procedures for Equipment Decontamination

All equipment must be decontaminated or discarded upon exit from the EZ, as determined by the OSC or designated representative. If equipment is decontaminated, then the OSC (or a designated alternate) shall be responsible for ensuring that the item has been sufficiently cleaned prior to exiting from the EZ. This inspection shall be noted in the site log. Any material that is generated through decontamination procedures will be stored in a designated area in the EZ until disposal arrangements are finalized.

The decontamination solution for this site is soap and water. Decontamination solution will be changed daily (at a minimum) and collected and stored on site until disposal arrangements are finalized.

7.2 Procedures for Personnel Decontamination

All personnel, including visitors, must enter and exit the EZ through the CRC. All personnel must sign the "HOT ZONE ENTRY/EXIT LOG" when entering and exiting the EZ. The decontamination procedure applies to personnel at this site wearing Level B and C protection. These are the minimum acceptable requirements:

Station 1: Equipment Drop

Deposit equipment used on site (tools, sampling devices, monitoring instruments, radios, etc.) on polyethylene sheeting. These items must be decontaminated or disposed of as waste prior to removal from the EZ.

Station 2: Outer Boot and Glove Removal

Remove outer boots and gloves. If outer boots are disposable, deposit in container with plastic liner. If non-disposable, store in a clean dry place. NOTE: If conditions warrant, an outer boot and outer glove wash and rinse will be available prior to this station.

Station 3: Tank Change (optional)

Exchange air tanks, don new outer gloves and boot covers, tape joints, and return to the EZ. Skip this step if continuing through the decontamination procedure.

Station 4: Outer Garment/Respiratory Protection/Inner Glove Removal

If applicable, remove SCBA backpack and remain on air as long as possible. Remove chemical resistant outer garments and deposit in container lined with plastic. Decontaminate or dispose of splash suits as necessary. Remove hard hat, facepiece, and if applicable, deposit SCBA on a clean surface. Respiratory cartridges will be discarded as appropriate. Wash and rinse respirator at least daily. Wipe off and store respiratory gear in a clean, dry location. Remove inner gloves. Deposit in container for disposal.

Station 5: Emergency Deluge Shower/Eye Wash

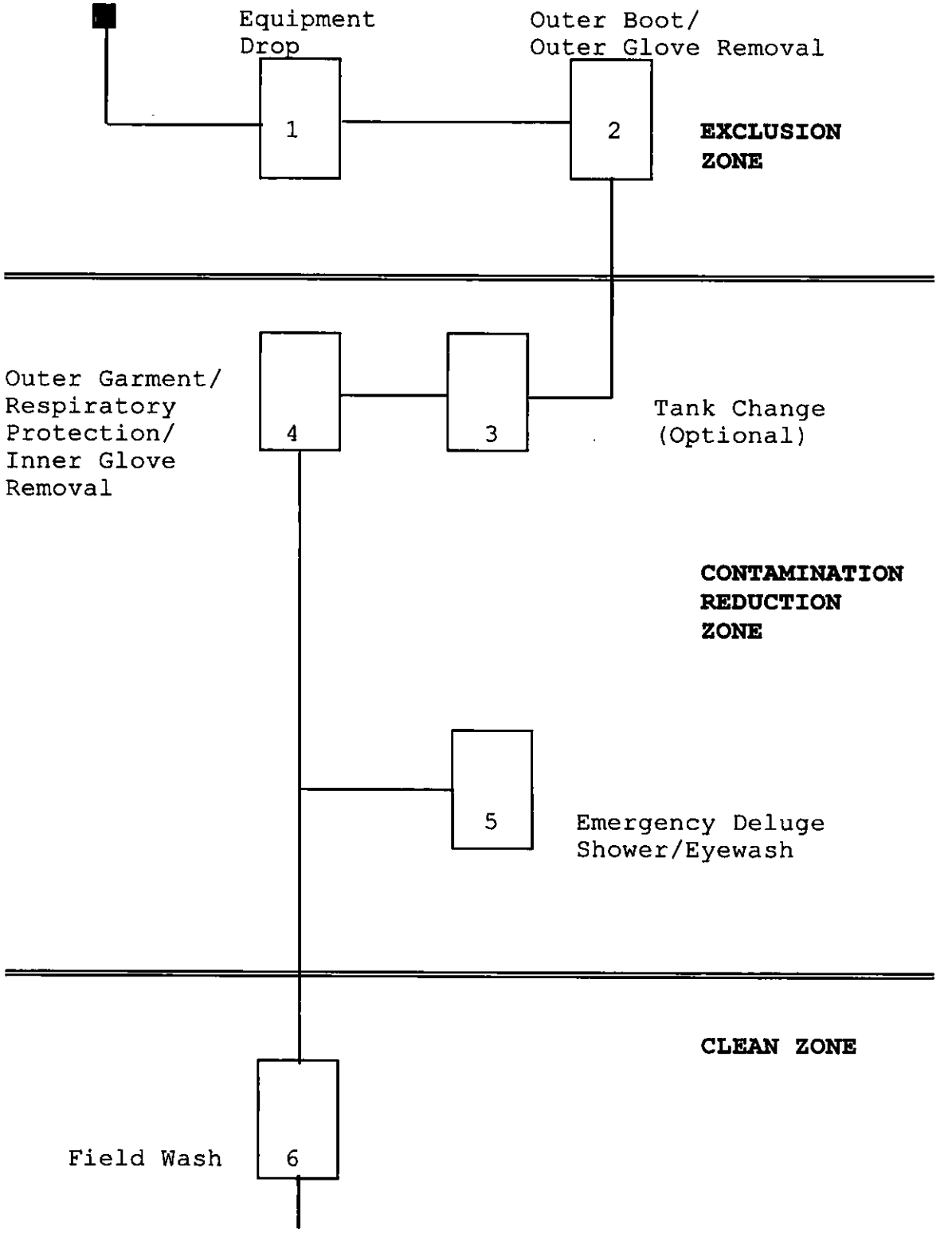
Use as needed.

Station 6: Field Wash

Wash hands and face with soap and water. Shower as soon as possible.

A diagram of the decontamination schemes for this site for standard work are shown on the following page.

7.3 Personnel Decontamination Procedure Diagram



8.0 EMERGENCY RESPONSE PLAN

Site personnel must be prepared for emergencies which include, but are not limited to: illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate. An emergency should be defined as an unexpected occurrence which creates an unsafe work environment.

8.1 Emergency Contacts for the American Glue & Resin Site

Fire:
Middleton Fire Department
Location: 4 Lake Street, Middleton, Massachusetts 01949
Telephone: Business: (978) 774-2211 or Emergency: 911

Police:
Middleton Police Department
Location: 1865 North Main Street, Middleton, Massachusetts 01949
Telephone: Business: (978) 774-4424 or Emergency: 911

Hospital Name:
Lahey Hithcock Clinic North
Location: 1 Essex Center Drive, Peabody, Massachusetts 01960
Telephone: (978) 538-4000
Chemical Trauma Capabilities? Yes

Directions from the Site to the Hospital (see Section 10.4):
Exit site and turn right onto School Street. Follow for approximately 1 mile (Road becomes Essex Street) to intersection with Route 114. Take left onto Route 114 (East) and follow for approximately 5.6 miles, then take right onto Prospect Street, then take third left onto Essex Center Drive, and into Hospital.

Poison Control Center telephone number: 1-800-682-9211

NOTE: Maps and directions to the hospital will be posted in field offices, decontamination trailers, decontamination area, and all other structures on the site.

The route to the hospital was verified on 4 January 1999 by START member Stephen Amirault. The total distance from the site to the hospital is approximately 7.8 miles. Approximate travel time is 15 minutes. The fire and police departments, and hospital were notified of site operations by START on 5 January 1999.

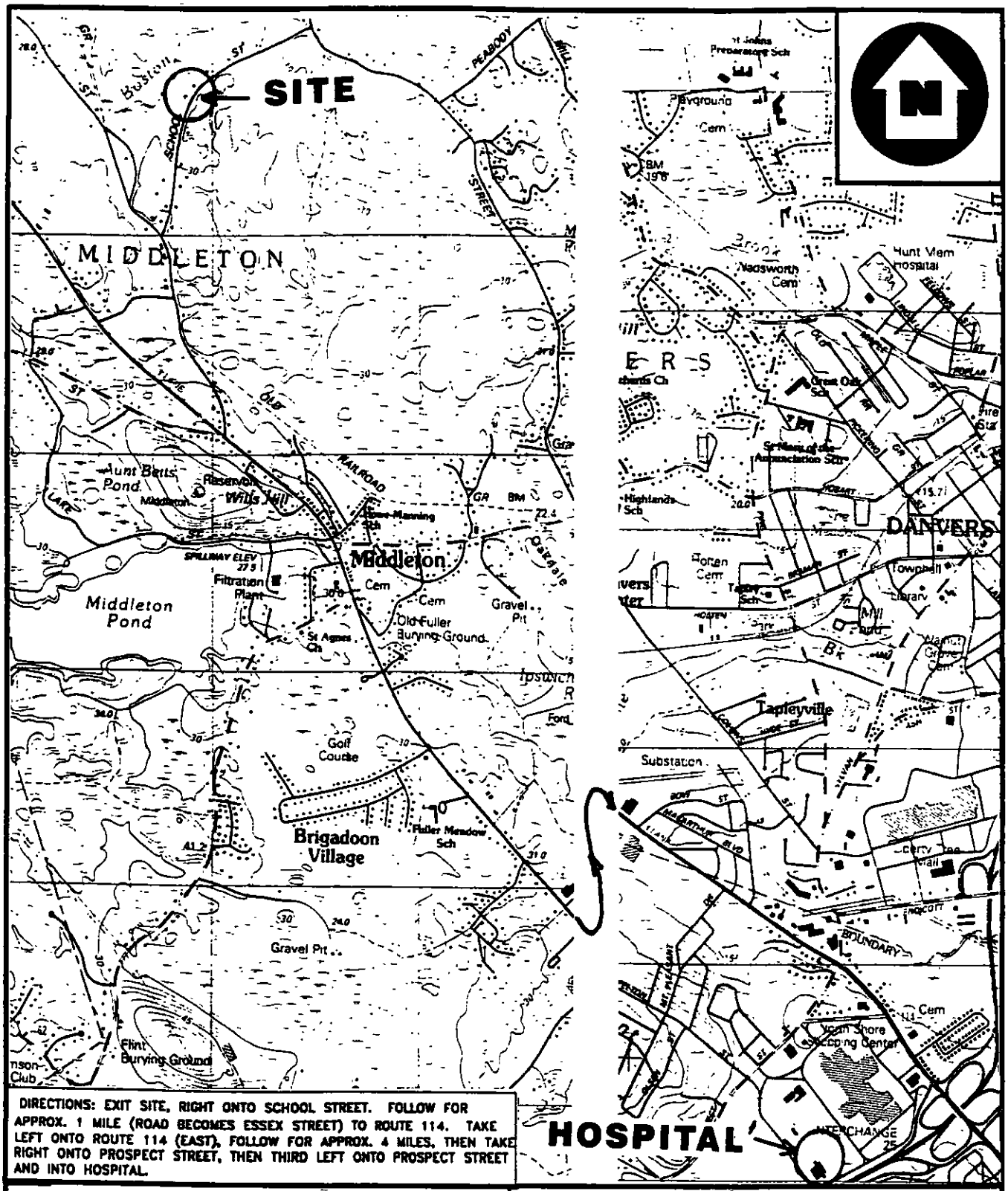
The following individuals have been trained in CPR and First Aid:
Stephen Amirault (START) Gilberto Irizarry (EPA)

8.2 Additional Emergency Numbers

Agency for Toxic Substances and Disease Registry (ATSDR)	404-639-0615 (24 hr)
Association of American Railroads, Bureau of Explosives	202-639-2222
Center for Disease Control	404-639-3535
Chemical Transportation Emergency Center	800-424-9300
Compressed Gas Association	703-412-0900
EPA Environmental Response Team	731-321-6660
National Response Center	800-424-8802
NIOSH Technical Information Line	800-356-4674
OSHA - Region I Boston, MA	617-565-9860
Roy F. Weston, Inc. 24-Hour Medical/Emergency Consultant (Continuum Health Care)	800-229-3674 (24 hr)
State Emergency Response Committee: MA Emergency Management Agency	508-820-2000
State Environmental Agency: Massachusetts Department of Environmental Protection Northeast Region Contact: William Gaugn	617-292-5856 (Day) 617-556-1133 (Night) 617-292-7600
U.S. EPA Region I: Emergency Line	617-223-7265 (24 hr)
U.S. Department of Transportation: (CFR 49 information)	202-366-4488

8.3 Emergency Equipment Available On Site

Communications Equipment	Location
Temporary Mobile Phones: (site mobilization)	EPA OSC: (617) 699-5913 ERRS: To be determined START: To be determined
Private Telephones:	CP ( ) Not yet installed
Two-Way Radios:	
Emergency Alarms/Horns:	CP, CRZ
Medical Equipment	
First Aid Kits:	CP, CRZ
Inspection Date:	See (On-Site) Site File By: See (On-Site) Site File
Eye Wash Station:	CRZ
Emergency Deluge Shower:	CRZ
Fire-Fighting Equipment	
Fire Extinguishers:	CP, CRZ, Work Areas
Inspection Date:	See (On-Site) Site File By: See (On-Site) Site File
Spill or Leak Equipment	
Absorbent Boom/Pads:	Sorbent Pads, CRZ
Dry Absorbent:	Speedy-Dry, CRZ



DIRECTIONS: EXIT SITE, RIGHT ONTO SCHOOL STREET. FOLLOW FOR APPROX. 1 MILE (ROAD BECOMES ESSEX STREET) TO ROUTE 114. TAKE LEFT ONTO ROUTE 114 (EAST), FOLLOW FOR APPROX. 4 MILES, THEN TAKE RIGHT ONTO PROSPECT STREET, THEN THIRD LEFT ONTO PROSPECT STREET AND INTO HOSPITAL.

FIGURE 2
HOSPITAL LOCATION MAP

AMERICAN GLUE & RESIN
40 SCHOOL STREET
MIDDLETON, MASSACHUSETTS

SOURCE: USGS TOPOGRAPHICAL 7.5 MINUTE SERIES, READING AND SALEM MASSACHUSETTS.

WESTON® MANAGERS DESIGNERS/CONSULTANTS

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

DRAWN BY	DATE	TDD NO.
S. AMIRAULT	1/99	98-12-0011
APPROVED BY	DATE	PCS NO.
		5654

8.5 Emergency Contingency Plan

In the event of an emergency at the site, the OSC will coordinate and initiate the emergency contingency plan as applicable. The EPA will initiate shutdown procedures when activities are judged by the OSC (or local authorities) to involve an imminent danger condition. The time of shutdown will vary. It must be long enough to properly assess the danger condition, to establish a work plan through consultation with key site personnel and to initiate the Pollution Report/Incident Report relative to the issue creating the imminent danger situation. In the case of a major emergency, the OSC will support the Middleton Fire Department's response, as may be required.

The EPA will also shut down or curtail operations in the event of ANY emergency. The OSC will make decisions after input from the Site Safety Monitor, RM, and the Fire Department Representative.

In accordance with 29 CFR 1910.120 (l)(3), this plan shall be periodically reviewed and amended as necessary to maintain currency with new or changing site conditions or information. The plan will be rehearsed and discussed as part of the general site health and safety training program. In addition, the plan should be fully reviewed with any agencies which may be responding to an emergency at the site.

The following are designated as Key Personnel for the removal action.

NAME	TITLE	ORGANIZATION
Gilberto Irizarry	OSC	U.S. EPA
Stephen Amirault	Safety Monitor	Roy F. Weston, Inc. START
Daniel Hackett	ERRS Response Manager	I.T. Corporation ERRS
Captain	Captain	Middleton Fire Department
Captain	Police Chief	Middleton Police Department

8.5.1 Implementation

The OSC must assess possible hazards to human health or the environment that may result from any emergency situation. The Emergency Contingency Plan will be implemented in any of the following situations:

- **Fire**

  1) A fire occurs on site which could cause the release of toxic fumes or other contaminants.

  2) A fire occurs on site which could possibly spread to off-site areas.

  3) An uncontrolled fire from off-site areas that could threaten site activities.

4) Use of water, or water and chemical fire suppressants that could result in uncontained contaminated runoff.

- **Spills or Hazardous Material Release**

  1) The spill could cause the release of toxic vapors or fumes into the atmosphere in concentrations higher than the PEL, STEL, or IDLH's recommended by the Federal NIOSH and OSHA Regulations, or EPA's site safety plan levels.

  2) A spill that cannot be contained on site, resulting in a potential for off-site soil contamination and/or ground or surface water pollution.

- **Severe Weather Conditions Requiring Emergency Shut Down**

  1) Sighting of a tornado in the area.

  2) A tornado warning is in effect for the area.

  3) A lightning storm is underway in the area (storm center less than 5 miles away).

  4) A hurricane warning is in effect in the area.

  5) Snow emergency as declared by the OSC.

- **OTHER EMERGENCIES**, as fit the definition found in paragraph 8.0.

8.5.2 Emergency Response Procedures

The initial response to any emergency will be directed towards protecting human health and safety, and then the environment. Secondary considerations will be contaminant identification, containment, treatment, and disposal. If an emergency is within the on-site emergency response capabilities, the OSC will implement the necessary emergency action. If an emergency is beyond the capabilities of the operating crew, the OSC will notify the Middleton Fire and Police Departments, and any other appropriate agencies.

- **Identification of Hazardous Materials**

  The OSC will immediately identify the character, exact source, amount and extent of any release. The initial identification method will be the visual analysis of the material and location of the release. If the released material cannot be identified, actual samples will be taken for analysis.

- **Hazard Assessment**

  The OSC will assess possible hazards to human health or the environment that may result from a release, fire, severe weather conditions, or any other emergency situation. The OSC will assess the hazards posed by an incident through the following steps, as appropriate:

  1) Identify the material(s) in the incident.

  2) Consult appropriate references to determine potential adverse effects of exposure/releases, and appropriate safety precautions.

  3) Identify exposure and/or release pathways and the quantities of material involved.

  This assessment will consider both the direct and indirect effects of the emergency conditions. This would include the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff due to the water or chemical agents used to control fire or heat -induced explosions.

  Based on this assessment, the OSC will determine what risk is posed to workers and neighboring populations. If the incident cannot be controlled by operating personnel without incurring undue risk, the OSC will order the evacuation of all workers at risk and notify appropriate response agencies of the situation and assistance required. If the OSC determines that any persons outside of the site are at risk as a result of the incident, the OSC will contact the appropriate agencies and departments and advise them of the risk and the need or potential need to institute off-site evacuation procedures.

- **Specific Control Procedures**

  1) Fire

     When an on-site fire appears imminent, or is occurring, all site activity shall cease. The OSC will assess the severity of the situation and decide whether or not the emergency is controllable with existing portable fire extinguishers, site equipment, or materials at hand. Firefighting will not be performed if the risk to operating personnel appears high.

The Middleton Fire Department will be called in all situations in which fires have occurred.

If the situation appears uncontrollable, and poses a direct threat to human life, the warning signal will be activated to all personnel to secure emergency equipment and immediately evacuate the area and report to the designated meeting point for a personnel count. The OSC will alert personnel when danger has passed, as determined by fire department personnel.

All equipment used in the emergency will be immediately cleaned, refurbished, or decontaminated for use in the event of any future emergency.

2) Spill or Hazardous Material Release

If a hazardous waste or material release results in a probable hazardous material release, the information will be immediately relayed to the OSC. The OSC will assess the magnitude and potential seriousness of the release by reviewing the following information:

a) MSDSs of the material spilled or released, if known.

b) Source of the release or spillage of hazardous material.

c) An estimate of the quantity released and the rate at which it is being released.

d) The direction in which the release is moving.

e) Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result.

f) Potential for fire resulting from the situation.

g) Estimate of area under the influence of the situation.

In the event of a spill or release, all personnel not involved with emergency response activity will be evacuated from the

immediate area to the designated meeting place. The area will be taped or barricaded. Based on air monitoring data, evacuation procedures may be implemented or area activities will resume.

3) Severe Weather Conditions Requiring Emergency Shut Down

The OSC or designated representative will monitor weather reports issued by the National Weather Service (NWS).

When a tornado is sighted in the area, when a tornado warning has been issued, or when a lightning storm occurs, the information will be immediately relayed to the OSC. The OSC will institute emergency shutdown procedures in the case of a tornado sighting, and all personnel shall proceed indoors for a head count after completing appropriate shutdown procedures. In the case of a tornado warning or lightning storm, procedures shall be stopped and all personnel shall stand by for emergency procedures as issued by the OSC. When the storm passes, the OSC will inspect on-site equipment to ensure its readiness for operation. If any emergency equipment has been damaged, the equipment will be repaired or replaced before site activities resume.

If a hurricane warning issued by the NWS is in effect in the area, the OSC will issue shutdown orders.

If the OSC inspection indicates a fire or release has occurred as the result of a severe weather condition, the OSC will follow the procedures outlined above.

- **Prevention of Recurrence or Spread of Fires, Explosion, or Release**

The OSC will investigate the cause of any incident. If a cause or likely cause can be established, necessary steps to reduce or eliminate a recurrence will be implemented. These changes will be identified in an amendment to this safety plan.

- **Storage and Treatment of Released Material**

Immediately after an emergency, the OSC will make arrangements for treatment, storage, or disposal of recovered wastes and contaminated material. Recovered wastes will be analyzed for disposal parameters along with other wastes on site.

- **Post-Emergency Equipment Maintenance**

  After an emergency event, all emergency equipment will be cleaned and/or decontaminated so that it is serviceable for use or it will be replaced. Before operations are resumed, an inspection of all safety equipment will be conducted. State and Local authorities, as appropriate, will be notified that post-emergency equipment maintenance has been performed and operations can resume.

- **Emergency Equipment**

  In preparation for a fire or a release of hazardous materials, the following list of fire fighting, containment, and emergency equipment will be available from ERRS at the site operations area.

  1) Fire extinguishers: Dry chemical type ABC, 10 lb and 20 lb.

     Type A is capable of extinguishing fires involving ordinary combustible material such as wood, cloth, paper, rubber, and many plastics. Type B is capable of extinguishing fires involving flammable liquids, oils, greases, tar, oil base paints, lacquers, and flammable gas. Type C is capable of extinguishing fires involving energized electrical equipment. All extinguishers must comply with National Fire Code Standards for portable fire extinguishers. Type ABC is appropriate for all three types of fires.

  2) Firefighting equipment.

     The Middleton Fire Department will be contacted in the event of a fire which can not be extinguished with the fire extinguishers provided on-site.

  3) Spill and containment materials:

     a) Loose, dry, absorbent material (e.g., vermiculite or multipurpose sorbent) to contain and absorb spills.

     b) Steel-type shovels with wooden handles for the physical containment of any released hazardous constituents.

     c) Wrenches and tools for tightening fittings and valves. The nature of the contaminants may require some of these tools to be non-sparking.

4) Emergency alarm systems: Four blasts of an air horn every 30 seconds until evacuation is complete.

A drill utilizing the alarm will be conducted to ensure that it is distinctive and recognizable above ambient background noise. The alarm system will conform to 29 CFR 1910.165.

5) First aid supplies and Bloodborne Pathogens Exposure Control Kit.

A completely stocked first aid kit will be maintained in the Command Post. An inventory of the first aid kit appears in the On-Site File for the site.

6) Emergency eye wash unit (located in the CRZ).

7) Protective clothing and equipment:

- Rubber or neoprene rubber boots.
- Short and long nitrile gloves.
- Chemical resistant suits.
- Hard hats and steel-toed boots.
- Face shields and protective eyeglasses.
- Chemical cartridge full-face air purifying respirators with cartridges for organic vapors and dust.

8) Emergency Cleanup Equipment.

Required resources that may not be available at the site will be immediately obtained from local commercial sources.

- **Evacuation Plan**

The first person recognizing an emergency situation that threatens human health or the environment shall notify the OSC or the person responsible for site operations in the absence of the OSC, who will evaluate the situation and determine the need for a site evacuation. The evacuation plan consists of:

1) The signal to evacuate, as indicated by the emergency alarm signal (air horn).
2) Leaving the area quickly by the nearest safe exit. Operating personnel are to escort visitors out of the immediate area. Personnel are to take note, before leaving, of where the

emergency situation exists so they do not jeopardize their safety by walking into that area. All machinery will be shut off.

3) Assembling in the designated meeting area (indicated in Appendix C - Site Diagram/Work Zones), personnel count and further instructions.

4) The OSC further directing actions as necessary and initiating the proper notification procedures for the agencies involved. No one is to return to the site unless so instructed by the OSC.

Three levels of evacuation may be declared:

A Evacuation of EPA's immediate work area (EZ and CRZ).

B Evacuation of EPA's work areas and close surrounding areas.

C Evacuation of any areas beyond the site area proper, in the opinion of the Middleton fire department or other agency, are threatened by the subject incident.

- **Reporting, Critique, and Follow-up**

The OSC will note, in appropriate site logs, the implementation of any portion of the contingency plan. The log entries will include:

1) The date, time, and type of incident (the nature of the incident or emergency such as, fire, explosion, downed power lines, injury to workers, etc.).

2) A description of the cause, actions taken, materials (and volumes involved), and other information appropriate for the incident.

3) A critique of the effectiveness of the emergency response actions taken (Emergency response action must be taken in all cases of emergencies).

Dependent upon the nature of the incident, the OSC will:

1) Report the incident to the Regional Response Center for further assistance and coordination with other agencies.

2) Include details of the incident in a Pollution Report (POLREP), and/or accident/incident report(A/I) to be transmitted as soon as possible, but not later than 24 hours after the incident. The (POLREP)(A/I) is to be initiated during the shut down phase.

3) Amend site work/safety plans as applicable and appropriate, to eliminate or mitigate the possibility of recurrence of the incident.

9.0 STANDARD OPERATING PROCEDURES

9.1 Drum and Container Handling

Drums and containers on hazardous waste sites present a number of safety hazards to site personnel which could result in injury, illness or death and could cause fires, explosions, spills, or emissions of toxic liquids or gases. It is important that those persons responsible for handling the drums or containers are aware of these hazards and take precautions to prevent accidents. The movement and opening of drums will be in accordance with 29 CFR 1926 Subpart M.

1. Location and Inventory of Drums

   a. Drums should be considered to contain extremely flammable, reactive, or highly toxic material until positive identification has been made. Level B personal protective equipment at a minimum is mandatory until such identification is made.

   b. Background information on the site, which includes analyses of soil, surface water and groundwater samples, and such analyses of random drum samples should be considered in planning site entry and drum handling activities.

   c. Direct-reading air monitoring equipment (combustible gas indicator, oxygen meter, organic vapor analyzer, radiation meter) must be used to assist in locating leaking drums, areas of contamination, or other potential health and safety hazards.

   d. Approach drums and containers cautiously, and visually inspect for identification information and physical damage. Do not approach swollen drums. Use equipment with a drum grappler and explosion protection to isolate them and relieve pressure remotely. Use binoculars or remote handling equipment to inspect containers regarded as unsafe.

   e. Personnel shall not stand upon or work from drums or containers.

2. Drum Handling

   a. Drums and containers must be considered to contain extremely flammable, reactive, or toxic materials until positive identification has been made. Level B personal protective equipment is required during drum handling activities.

b. Drums of poor or questionable integrity should be overpacked or have the liquid contents transferred to a new drum. Follow liquid transfer safety procedures including bonding and grounding. Overpacked drums can then be moved to a designated staging area.

c. Use non-sparking hand tools.

d. When using slings, yokes, or other lifting equipment, workers must stand well away from the work area while the lift is being made.

e. Do not handle badly swollen drums until the pressure is relieved.

f. Vehicle cabs must have splash and blast protection for the operator.

g. Where explosive, shock-sensitive, or high-pressure materials are known or expected, the drum should be handled remotely. Workers must be protected from a potential blast by bunkers, blast shields, or other suitable blast containment or barriers.

h. Monitor the atmosphere frequently or continuously to detect changing conditions and when in proximity to containers with unknown contents.

3. Drum Staging and Sampling

a. Use remote drum handling equipment as much as practical.

b. Stage potentially explosive or shock-sensitive containers in diked, bunkered areas, clearly posted with warnings and protected from heat and physical damage.

c. Stage compatible liquid wastes within containment dikes or structures to hold spilled materials. Have emergency absorbent and recovery equipment on hand.

d. Clean up spills promptly. Do not use sampling equipment on consecutive containers unless they are thoroughly decontaminated.

e. Stage drums to minimize the possibility of chain reactions. Do not stack drums unless secured on pallets and only if necessary. Leave adequate aisle spaces for emergency evacuation and access.

f. Use only non-sparking hand tools if drums are to be opened manually.

4. Consolidation and Storage

   a. Perform compatibility testing before bulking or mixing wastes. Seal drums after sampling.

   b. Segregate wastes according to compatibility class.

   c. Inspect storage areas routinely.

   d. Maintain adequate aisle space for access and emergency exit.

   e. Keep the storage area well drained. Keep explosives, gas cylinders, and reactive materials in dry, cool, shaded areas.

5. Fire Protection

   a. Have chemical fire fighting equipment on hand (i.e., dry chemical fire extinguishers, A-triple-F foam, etc.).

   b. Have an emergency plan prepared before beginning drum handling activities. Contact and coordinate with local emergency services.

   c. Use non-sparking tools. Be aware of other potential ignition sources (i.e., lights, vehicular engines, electrical tools, etc.). Use grounding and bonding cables.

   d. Ventilate confined spaces to minimize accumulation of volatile or toxic vapors.

6. Personal Protective Equipment

   a. In situations where the contents of drums or containers are unknown, Level B personal protective equipment, at a minimum, is required, until such time as the contents of the drums are positively identified or determined to be non-hazardous.

   b. Sampling of drums of unknown contents is always done in Level B PPE.

   c. Operators must be protected by splash and blast protection, and they must wear respiratory protection comparable to ground personnel.

   d. Airline respiratory systems must be protected from contamination and physical damage.

Note: Personnel using airline systems shall not be in the "splash vicinity" while drums are being opened, due to the "short tether." Drum opening shall be in SCBA only.

e. Where appropriate, employees will handle drums from behind blast shields. Use of remote handling equipment is preferred.

f. Where manual handling of steel drums is required and when using glass sampling tubes, cut-resistant gloves should be worn in addition to chemically resistant gloves.

g. An emergency alarm system and continuous communications are required when handling unknown, explosive, or shock sensitive wastes.

9.2 Laboratory Waste Packs

Laboratory packs (i.e., drums containing individual containers of laboratory materials normally surrounded by cushioning absorbent material) can be an ignition source for fires. They sometimes contain shock-sensitive materials. Such containers should be considered to hold explosive or shock-sensitive wastes until otherwise characterized. If handling is required, the following precautions are among those that should be taken:

- Prior to handling or transporting lab packs, make sure all non-essential personnel have moved a safe distance away.
- Whenever possible, use a grappler unit constructed for explosive containment for initial handling of such drums.
- Maintain communication with the Site Safety Officer and/or the command post until handling operations are complete.
- Once a lab pack has been opened, have a knowledgeable person (chemist) inspect, classify, and segregate the bottles within the pack, without opening them, according to the hazards of the wastes. The objective of a classification system is to ensure safe segregation of the lab packs' contents. Pack these bottles with sufficient cushioning and absorption materials to prevent excessive movement of the bottles and to absorb all free liquids, and ship them to an approved disposal facility.
- If crystalline material is noted at the neck of any bottle, handle it as a shock-sensitive waste until the contents are identified.

9.3 Liquid Transfer

One of the major concerns of transferring liquids from two or more containers into a third container is the mixing of incompatible materials. Mixing of incompatible

substances can result in a violent reaction, a fire, an explosion, or a release of toxic gases or vapors. Examples of incompatible materials include flammables and oxidizers, acids and bases, and magnesium and air or water.

No guidelines can provide a guarantee of complete safety, but they can increase one's sensitivity and awareness to the hazards involved in liquid transfers and increase the margin of safety in such operations.

1. PRIOR TO TRANSFERRING LIQUIDS, FOLLOW THESE PROCEDURES:

   a. Identify the product to be transferred. There are several sources for product identification:

      - Container Labels - These may not be reliable since mislabeling or reuse of labeled drums is common. Also, not all drums have labels.

      - Generator Information - Reliability of this information is directly related to the integrity and knowledge/ability of generator.

      - Material Safety Data Sheet (MSDS) - This is an especially good information source for virgin materials.

      - Laboratory Analytical Reports - This is highly reliable information identifying the physical and chemical characteristics of the material. A note of caution: If the sample was a composite of several containers, the individual container may show significantly different results than if analyzed separately. Reactions between chemicals may still take place.

   b. Determine what substances may be incompatible with each other. Perform compatibility analyses, as appropriate, prior to transfer or bulking operations.

   c. Determine the health and safety hazards associated with the materials to be transferred and communicate this information to the employees who will perform the transfer.

   d. Clean and decontaminate the receiving vessel(s) and transfer equipment prior to use.

2. SETUP PROCEDURES:

   a. Select the appropriate protective clothing and respiratory protection as specified in the site safety plan.

b. Verify the label or container information on each container to be transferred.

c. Select the work area carefully, considering other cleanup activities which are occurring simultaneously, and which may present a hazard (i.e., welding, grinding, traffic, etc.):

- Avoid areas which are poorly ventilated. Provide ventilation, if necessary.

- Avoid working in a confined space. Remove containers to an open area, if possible. If it is not possible to avoid a confined space, follow confined space procedures including air monitoring.

- Provide spill containment and have appropriate spill control materials or equipment on hand.

- When vehicles are involved in transfers, they must be considered sources of ignition. Carefully route the exhaust where it will not interfere with site operations. Be sure to chock wheels and secure brakes.

- Have available appropriate emergency equipment including alarms, safety showers, fire extinguishers and eye washes.

d. Ground vehicles and containers. Individual containers should share a common ground or be bonded.

e. Stripping poles should be equipped with a shutoff valve.

f. Spark-proof tools, in particular bung wrenches, should be used with flammables. Stripping poles should be nonferrous.

3. TRANSFER PROCEDURES:

a. Person(s) monitoring the transfer and the receiving vessel must maintain clear and continuous communication. If necessary, install a remote shutoff on the transfer pump being used.

b. Monitor the transfer continuously for changes in conditions. Stop the transfer at the first sign of fire, unusual pressure buildup, or reactivity.

c. Do not leave empty containers open. Reseal bungs or lids to prevent hazardous vapor or gas emissions and possible backflashes to the container.

4. CORROSIVE LIQUID TRANSFER GUIDELINES:

When preparing to make a transfer of a corrosive liquid from one container to another, always take the following steps:

a. Make sure the transfer equipment (i.e., hoses, fittings, pumps, and receiving vessels) are compatible with the corrosive material and clean. Avoid using metal fittings.

b. Avoid pouring corrosives. If pouring is necessary, do so slowly, avoid splashing, and use splash shields.

c. Know the locations of emergency showers and eyewashes. Rinse exposed tissue a minimum of 15 minutes with large amounts of water. Ensure proper medical attention.

d. Have an emergency escape route and a contingency plan.

e. Wear protective clothing resistant to corrosive materials (i.e., acid suits with hoods). Special protection must be provided for eyes (i.e., face shields and goggles, acid hoods). Gloves and boots must be taped to coveralls. Minimize exposed skin surface.

f. Use respiratory protection as determined by the site safety plan.

g. Make the transfer with caution, remembering that corrosives may react violently, even explosively, with a wide variety of chemicals and materials.

h. Conduct air monitoring as determined by the site safety plan.

5. FLAMMABLE/COMBUSTIBLE LIQUID TRANSFER GUIDELINES:

When preparing to make a transfer of flammable or combustible liquid from one container to another (i.e., storage tank to tanker), use the following procedures:

a. Clear the area of all open flames or other ignition sources, and all flammable and combustible materials.

b. Keep fire extinguishers in readily accessible locations.

c. Have an escape route planned in case of an accident.

d. Wear appropriate protective clothing (i.e., face shield and goggles, gloves, apron or chemical protective clothing, etc.) as determined by the site safety plan.

e. Locate the ground for the fixed container and verify that it is connected to the container.

f. Ground or bond the second container to the same ground as the first. When two portable containers are used, bond them together and establish a ground for one (i.e., setting on the ground).

g. Make the transfer with caution, remembering that fittings striking surfaces may cause sparks.

h. Conduct air monitoring as determined by the site safety plan.

9.4 Sampling Drums and Containers

Sampling of containers and drums shall be done in Level B personal protective equipment in accordance with EPA Standard Operating Safety Guidelines.

- Research background information about the waste contained in the drums or containers to be sampled, if possible.

- Develop a sampling plan which includes, but is not limited to: the selection of sampling devices and containers; the number, volume, and locations of samples to be collected; the standard operating procedures for specific sampling operations; and the appropriate personal protection utilized during all phases of the sampling operation.

- Stage all drums and containers in an appropriate area to conduct sampling activities. Mark or label all drums with a unique identification number to refer to after the completion of sampling activities. Prepare a drum log which identifies the location and description of each staged drum/container.

When manually sampling from a drum, use the following techniques:

- Keep sampling personnel at a safe distance while drums are being opened. Sample only after opening operations are complete. Reseal drums after samples are collected.

- Do not lean over other drums to reach the drums being sampled, unless absolutely necessary.

- Cover drum tops with plastic sheeting or other suitable uncontaminated materials to avoid excessive contact with the drum tops.

- Never stand on drums. This is extremely dangerous. Use mobile steps or another platform to achieve the height necessary to safely sample from the drums.

- Obtain liquid samples from the drums with either glass rods, dippers, or vacuum pumps. Do not tip drums to obtain sample material. Never lift drums or pour material from the drums to collect a sample. Do not use contaminated items such as discarded rags to sample. The contaminants may contaminate the sample and may not be compatible with the waste in the drum. Glass rods should be removed prior to pumping to minimize damage to pumps.

- Obtain solid samples from the drums with scoops or dippers. Avoid reaching into the drum to collect a sample. Use appropriate decontamination procedures between sample locations. Use disposable or dedicated items to collect and handle the samples.

- Once the sample is collected, complete all marking and labeling procedures and maintain proper chain-of-custody. Store and package samples in appropriate containers for transport to respective laboratories.

- Drums and containers shall be identified, classified, and segregated to assure material compatibility.

- Drum or container staging areas shall be prepared, maintained, and kept to the minimum number necessary to safely identify and classify materials and prepare them for transport.

- Staging areas shall be provided with adequate access and egress routes.

- Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

- Drums and containers used during site removal shall meet the applicable DOT, OSHA, and EPA regulations for the hazardous wastes they contain.

9.5 Shipping and Transport

Shipment of materials to off-site treatment, storage or disposal facilities involves the entry of waste hauling vehicles into the site. U.S. Department of Transportation (DOT) hazardous materials regulations (49 CFR Parts 171-178) and EPA hazardous waste transporter standards (40 CFR Part 263) for shipment of hazardous wastes must be complied with. Following the safety guidelines below:

- Locate the final staging (bulking) area as close as possible to the site exit.

- Prepare a circulation plan that minimizes conflict between cleanup teams and waste haulers. Install traffic signs, lights, and other control devices as necessary.

- Provide adequate area for on-site and hauling vehicles to turn around. Where necessary, build or improve on-site roads.

- Stage hauling vehicles in a safe area until ready for loading with drivers remaining in cab. Minimize the time that drivers spend in hazardous areas.

- Hauling vehicle drivers must have the applicable training and appropriate protective equipment for areas of the site they utilize.

- If drums are shipped, tightly seal the drums prior to loading. Overpack leaking or deteriorated drums prior to shipment. (Under most circumstances, overact drums used for hazardous wastes may not be reused [49 CFR Part 173.3(c)]). Make sure that truck bed and walls are clean and smooth to prevent damage to drums. Do not double stack drums. Secure drums to prevent shifting during transport.

- Keep bulk solids several inches below the top of the truck container. Cover loads with a layer of clean soil, foam, and/or tarp. Secure the load to prevent shifting or release during transport.

- Weigh vehicles periodically to ensure that vehicle and road weight limits are not exceeded.

- Decontaminate vehicle tires prior to leaving the site to ensure that contamination is not carried onto public roads (CFR 1910.120(k,2,iii)).

- Check periodically to ensure that vehicles are not releasing dust or vapor emissions off the site.

- Develop procedures for responding quickly to off-site vehicle breakdown and accidents to ensure minimal public impact.

10.0 SITE SAFETY PLAN ACKNOWLEDGMENT

10.1 Acceptance Log

I accept this Health and Safety Plan for the American Glue & Resin Site in Middleton, Massachusetts. It adequately provides for the health and safety of persons who will or may be affected by on-site operations.

Robert Hinten, Safety Officer U.S. EPA Region I Office of Site Remediation and Restoration	Date
Gilberto Irizarry, On-Scene Coordinator U.S. EPA Region I Emergency Planning and Response Branch	Date
Paul Callahan, Regional Safety Officer Roy F. Weston, Inc. Region I START	Date
Daniel Hackett, Response Manager I.T. Corporation Region I ERRS	Date
Kevin McMahon, MS, CIH I.T. Corporation Region I ERRS Safety Officer	Date

10.0 SITE SAFETY PLAN ACKNOWLEDGMENT

10.1 Acceptance Log

I accept this Health and Safety Plan for the American Glue & Resin Site in Middleton, Massachusetts. It adequately provides for the health and safety of persons who will or may be affected by on-site operations.

Robert Hinten, Safety Officer
U.S. EPA Region I Office of Site Remediation and Restoration

1/8/99
Date

Gilberto Irizarry, On-Scene Coordinator
U.S. EPA Region I Emergency Planning and Response Branch

1/11/99
Date

Paul Callahan, Regional Safety Officer
Roy F. Weston, Inc.
Region I START

1/9/99
Date

Daniel Hackett, Response Manager
I.T. Corporation
Region I ERRS

1-11-99
Date

Kevin McMahon, MS, CIH
I.T. Corporation
Region I ERRS Safety Officer

2/11/99
Date

10.0 SITE SAFETY PLAN ACKNOWLEDGMENT

10.1 Acceptance Log

I accept this Health and Safety Plan for the American Glue & Resin Site in Middleton, Massachusetts. It adequately provides for the health and safety of persons who will or may be affected by on-site operations.

_____ _____

Robert Hinten, Safety Officer
U.S. EPA Region I Office of Site Remediation and Restoration

Date

_____ _____

Gilberto Irizarry, On-Scene Coordinator
U.S. EPA Region I Emergency Planning and Response Branch

Date

_____ _____

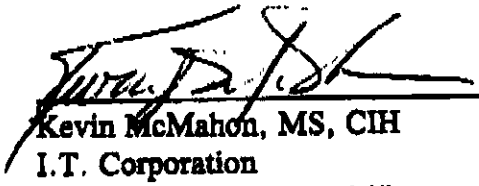
Paul Callahan, Regional Safety Officer
Roy F. Weston, Inc.
Region I START

Date

_____ _____

Daniel Hackett, Response Manager
I.T. Corporation
Region I ERRS

Date



Kevin McMahon, MS, CIH
I.T. Corporation
Region I ERRS Safety Officer

1/8/99
Date

10.2 Signature Page

I have read, understand and will abide by the procedures set forth in the Health and Safety Plan and Amendments for the American Glue & Resin Site in Middleton, Massachusetts.

Printed Name	Signature	Representing	Date
CATHERINE A. Pecor	Catherine A. Pecor	IT	1-11-99
Paul Ledoux	Paul Ledoux	IT	1-11-99
Stephen Amirault	Stephen Amirault	Weston/START	1/11/99
LEON BURTON	Leon Burton	IT	1/11/99
HENRY STOKE	Henry W Stoke	IT/OHM	1/12/99
Barry Tapp	Barry Tapp	IT/OHM	1/14/99
KEVIN HERON	Kevin B Heron	IT CORP	1/22/99
Paul Cullehan	Paul Cullehan	Weston/START	2/2/99
Janice Duarte	Janice Duarte	EPA	02/3/99
Rob Almeida	Robert Almeida	IT	02.04.99
Gary Benham	Gary Benham	IT	2/5/99
Amy Jean Lussier	Amy Jean Lussier	USEPA	2/9/99
Damon B. Methuin	Damon B. Methuin	IT	2/10/99
Kenneth Kukkonen	Kenneth Kukkonen	IT	2/11/99
Taylor NT Trent	Taylor N Trent	IT	2/11/99
Erin Heskett	Erin M. Heskett	EIA	2/11/99
Scott Loretta	Scott Loretta	RBA	2/11/99
EDMUND J. FORT	Edmund J. Fort	IT	2/18/99
Sylvia Kirsch	Sylvia Kirsch	EPA	2/23/99

Signature Page (Continued)

I have read, understand and will abide by the procedures set forth in the Health and Safety Plan and Amendments for the American Glue & Resin Site in Middleton, Massachusetts.

Printed Name	Signature	Representing	Date
JAMES A. WILLIAMS		IT	1/11/99
JOHN CARON		IT	1-18-99
David McIntyre		EPA	2/24/99
Pasquale Roze		START	3/3/99
Kathy Wynnyk		WESTON/START	3/5/99
JOHN E. BALL		Clean Ventures	3/29/99
Carl Collins		Clean Venture	3/29/99
Antonio L. Sousa		Clean Venture	3-29-99
William C McCabe		Clean Venture	3-29-99
Scott Saviola		Clean Ventures	3-29-99
JAY KETCHAM		FCI	3:30 PM
Ed Price			3/30/99
Jeff Clark		CVI	3/31/99
Bill Ebert		FCI	3/31/99
Pat Willette		FGF	4/5/99
Steve Robertson		MADEP	4/6/99
JOEL FALBO		IT	4/8/99
DAN SYLVIA		IT	4/8/99
Mark Warren		START	4/14/99

Signature Page (Continued)

I have read, understand and will abide by the procedures set forth in the Health and Safety Plan and Amendments for the American Glue & Resin Site in Middleton, Massachusetts.

Printed Name	Signature	Representing	Date
David Lapuzata		MADEP	4/16/99
Steve Martino		FT	4/19/9
Leo F Cormier		Bd of Health	4/22/99
Osvaldo Mendoza		CVE	5/4/99

APPENDIX A

HEALTH AND SAFETY PLAN AMENDMENTS

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 1: Amendment to downgrade PPE for drum overpacking to level C for drums with solid contents

DATE: 2/3/99

REASON FOR AMENDMENT: To specify PPE requirements for drum overpacking activities.

ALTERNATE SAFEGUARD PROCEDURES: N/A - continue air monitoring - all other Health + Safety protocols to be continued

REQUIRED CHANGES IN PPE: Level C PPE for drum overpacking involving drums with solid contents - liquid content - containing drums will continue to be overpacked in level B per current Health + Safety protocols

ERRS Response Manager	2/3/99 (Date)	ERRS Safety Manager	2/3/99 (Date)
START Lead	2/3/99 (Date)	START RSO	2/3/99 (Date)
U.S. EPA OSC	2/3/99 (Date)	U.S. EPA Safety Officer	2/3/99 (Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 2 : Collection of surface soil samples from on-site locations where drums were formerly stored and underground tanks were formerly located, and collection of groundwater samples from on-site monitoring wells located throughout the property.

DATE: 12 February 1999

REASON FOR AMENDMENT: To identify PPE requirements for additional sampling tasks of on-site soil and groundwater sampling. Soil and groundwater samples will be collected by START personnel.

ALTERNATE SAFEGUARD PROCEDURES: Soil samples will be collected in Level C PPE. Air monitoring for organic vapors will be conducted at each soil sample location with a PID or FID. Groundwater samples will be collected in modified Level D PPE. Air monitoring will be conducted of each well head location with a PID or FID. See Section 4 for specific PPE requirements.

REQUIRED CHANGES IN PPE: None

ERRS Response Manager	(Date)	ERRS Safety Manager	(Date)
[signature]	2/16/99	[signature]	2/12/99
START Lead	(Date)	START RSO	(Date)
		[signature]	2/17/99
U.S. EPA OSC	(Date)	U.S. EPA Safety Officer	(Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT #3: Removing/Cleaning out contents of 30 cubic yard roll off container located adjacent to loading dock in rear of building. Container was brought to the site in 1998 by a contractor hired by the property owner, and was filled with crushed drums and other debris by a second contractor.

DATE: 2 March 1999

REASON FOR AMENDMENT: To identify requirements for removing/cleaning out roll off contents. Activities will be conducted by ERRS personnel.

ALTERNATE SAFEGUARD PROCEDURES: All removal/clean out activities will be conducted in accordance with ERRS confined space entry procedure number 6-1 (revised July 1998) and 29 CFR 1910.146. A confined space entry permit will be obtained prior to entry. Air monitoring will be conducted inside the roll off by ERRS personnel prior to entry using an O/LEL meter and PID or FID. Perimeter monitoring will be conducted by START during cleaning operations. Personnel will enter the container via ladders on the outside of the container, and along the inside wall of the container. Entry into the roll off will be conducted in Level B PPE. If conditions of the roll off contents allow the door to be opened without spilling the contents onto the ground, the rear door of the container will be opened to allow for an additional means of egress.

REQUIRED CHANGES IN PPE: Level B PPE will be used for removal/clean out activities covered by this amendment.

ERRS Response Manager	3/11/99 (Date)	ERRS Safety Manager	3/10/99 (Date)
START Lead	3/2/99 (Date)	START RSO	3/10/99 (Date)
U.S. EPA OSC	3/10/99 (Date)	U.S. EPA Safety Officer	3/3/99 (Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 4: Removing/Cleaning out contents of one abandoned 3,000 gallon steel tank located adjacent to loading dock in rear of building, and one 300 gallon steel tank located inside the building near the loading dock area. The 3,000 gallon tank located outside the building is on its side and contains approximately 200 gallons of glue product remaining in it. The 300 gallon tank has approximately 100 gallons of product remaining. Each tank has an access manway on the top side which will be used for cleanout operations. Tank cleaning operations will require confined space entry (CSE).

DATE: 15 March 1999

REASON FOR AMENDMENT: To identify CSE requirements for removing/cleaning out tank contents. Activities will be conducted by ERRS personnel.

ALTERNATE SAFEGUARD PROCEDURES: All removal/ clean out activities will be conducted in accordance with ERRS CSE procedure number 6-1 (revised July 1996) and 29 CFR 1610.146. An ERRS CSE permit and written rescue plan will be obtained prior to entry. Initial air monitoring will be conducted inside each tank by ERRS personnel prior to entry using an O2/LEL meter and PID or FID. Continuous air monitoring of the confined space using an O2/LEL meter and PID or FID will be conducted by ERRS personnel during all entry activities. If sustained levels of > 1,000 ppm (PID or FID) or >1% LEL are detected, work will be suspended until a flash point of the material can be determined and the ERRS project CIH can be contacted. Perimeter monitoring will be conducted by START during cleaning operations. Personnel will enter the container via the manways located on top of each tank. Entry into the tanks will be conducted in Level B PPE.

REQUIRED CHANGES IN PPE: Level B PPE will be used for removal/clean out activities covered by this amendment.

ERRS Response Manager	3/19/99 (Date)	ERRS Safety Manager	(Date)
START Lead	3/19/99 (Date)	START RSO	3/17/99 (Date)
U.S. EPA OSC	3/19/99 (Date)	U.S. EPA Safety Officer	3/19/99 (Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT #4: Removing/Cleaning out contents of one abandoned 3,000 gallon steel tank located adjacent to loading dock in rear of building, and one 300 gallon steel tank located inside the building near the loading dock area. The 3,000 gallon tank located outside the building is on its side and contains approximately 200 gallons of glue product remaining in it. The 300 gallon tank has approximately 100 gallons of product remaining. Each tank has an access manway on the top side which will be used for cleanout operations. Tank cleaning operations will require confined space entry (CSE).

DATE: 15 March 1999

REASON FOR AMENDMENT: To identify CSE requirements for removing/cleaning out tank contents. Activities will be conducted by ERRS personnel.

ALTERNATE SAFEGUARD PROCEDURES: All removal/ clean out activities will be conducted in accordance with ERRS CSE procedure number 6-1 (revised July 1996) and 29 CFR 1610.146. An ERRS CSE permit and written rescue plan will be obtained prior to entry. Initial air monitoring will be conducted inside each tank by ERRS personnel prior to entry using an O/LEL meter and PID or FID. Continuous air monitoring of the confined space using an O/LEL meter and PID or FID will be conducted by ERRS personnel during all entry activities. If sustained levels of ≥ 1,000 ppm (PID or FID) or ≥ 1% LEL are detected, work will be suspended until a flash point of the material can be determined and the ERRS project CSE can be contacted. Perimeter monitoring will be conducted by START during cleaning operations. Personnel will enter the container via the manways located on top of each tank. Entry into the tanks will be conducted in Level B PPE.

REQUIRED CHANGES IN PPE: Level B PPE will be used for removal/clean out activities covered by this amendment.

ERRS Response Manager	(Date)	ERRS Safety Manager: Paul G. Fowler	3/17/99 (Date)
START Lead	(Date)	START RSO: Paul Cullen	3/17/99 (Date)
U.S. EPA OSC	(Date)	U.S. EPA Safety Officer	(Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 5 :: Removing/Cleaning out contents of 30 cubic yard roll-off container located adjacent to loading dock in rear of building. Container was brought to the site in 1998 by a contractor hired by the property owner, and was filled with crushed drums containing product, and other debris, by a second contractor. In order to properly ship contents off-site for disposal, drums and metal debris must be segregated from product contents of roll-off.

DATE: 9 April 1999

REASON FOR AMENDMENT: To identify requirements for removing/cleaning crushed drums from roll-off. Activities will be conducted by ERRS personnel.

ALTERNATE SAFEGUARD PROCEDURES: All removal/ clean out activities will be conducted in accordance with ERRS confined space entry procedure number 6-1 (revised July 1996) and 29 CFR 1610.146, as specified in HASP amendment No. 3. Metal drums and contents will be picked up with an excavator bucket, gross contamination will be allowed to drain into roll-off, and then the drum will be placed into a containment area adjacent to the roll off. If required, the remaining contents of each drum will be cleaned out from the drum by hand in the containment area. Due to the possible flammability of the drum contents, only non sparking tools will be utilized inside the roll off if the drums need to be cut to empty out contents. Power cutting shears will be used only if necessary and their use will be restricted to the containment area outside the roll off, where a fire extinguisher and spill kit will be located.

REQUIRED CHANGES IN PPE: Level B PPE will be used for removal and cleaning activities covered by this amendment. Continuous air monitoring will be conducted of the drums in the containment area, as well as in accordance with confined space entry procedures and HASP amendments no. 3 and 4.

ERRS Response Manager	4/9/99 (Date)	ERRS Safety Manager	(Date)
START Lead	4/9/99 (Date)	START RSO	(Date)
U.S. EPA OSC	4/9/99 (Date)	U.S. EPA Safety Officer	(Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 5 : Removing/Cleaning out contents of 30 cubic yard roll-off container located adjacent to loading dock in rear of building. Container was brought to the site in 1998 by a contractor hired by the property owner, and was filled with crushed drums containing product, and other debris, by a second contractor. In order to properly ship contents off-site for disposal, drums and metal debris must be separated from product contents of roll-off.

DATE: 9 April 1999

REASON FOR AMENDMENT: To identify requirements for removing/cleaning crushed drums from roll-off. Activities will be conducted by ERRS personnel.

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REQUIRED CHANGES IN PPE: Level B PPE will be used for removal and cleaning activities covered by this amendment. Continuous air monitoring will be conducted of the drums in the containment area, as well as in accordance with confined space entry procedures and HASP amendments no. 3 and 4.

ERRS Response Manager — 4/9/99 (Date)

START Lead — 4/9/99 (Date)

U.S. EPA OSC — 4/9/99 (Date)

ERRS Safety Manager — (Date)

START RSO — 4/9/99 (Date)

U.S. EPA Safety Officer — 4/12/99 (Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT # 5 : Removing/Cleaning out contents of 30 cubic yard roll-off container located adjacent to loading dock in rear of building. Container was brought to the site in 1998 by a contractor hired by the property owner, and was filled with crushed drums containing product, and other debris, by a second contractor. In order to properly ship contents off-site for disposal, drums and metal debris must be segregated from product contents of roll-off.

DATE: 9 April 1999

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REQUIRED CHANGES IN PPE: Level B PPE will be used for removal and cleaning activities covered by this amendment. Continuous air monitoring will be conducted of the drums in the containment area, as well as in accordance with confined space entry procedures and HASP amendments no. 3 and 4.

ERRS Response Manager	4/9/99 (Date)	ERRS Safety Manager	4/12/99 (Date)
START Lead	4/9/99 (Date)	START RSO	4/9/99 (Date)
U.S. EPA OSC	4/9/99 (Date)	U.S. EPA Safety Officer	(Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT #__:_____

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DATE:_____

REASON FOR AMENDMENT:_____

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ALTERNATE SAFEGUARD PROCEDURES:_____

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REQUIRED CHANGES IN PPE:_____

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_____	_____	_____	_____
ERRS Response Manager	(Date)	ERRS Safety Manager	(Date)
_____	_____	_____	_____
START Lead	(Date)	START RSO	(Date)
_____	_____	_____	_____
U.S. EPA OSC	(Date)	U.S. EPA Safety Officer	(Date)

HEALTH and SAFETY PLAN AMENDMENT
for the
American Glue & Resin Site in Middleton, Massachusetts

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

SITE SAFETY PLAN AMENDMENT #__:_____

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_____

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DATE:_____

REASON FOR AMENDMENT:_____

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_____

ALTERNATE SAFEGUARD PROCEDURES:_____

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REQUIRED CHANGES IN PPE:_____

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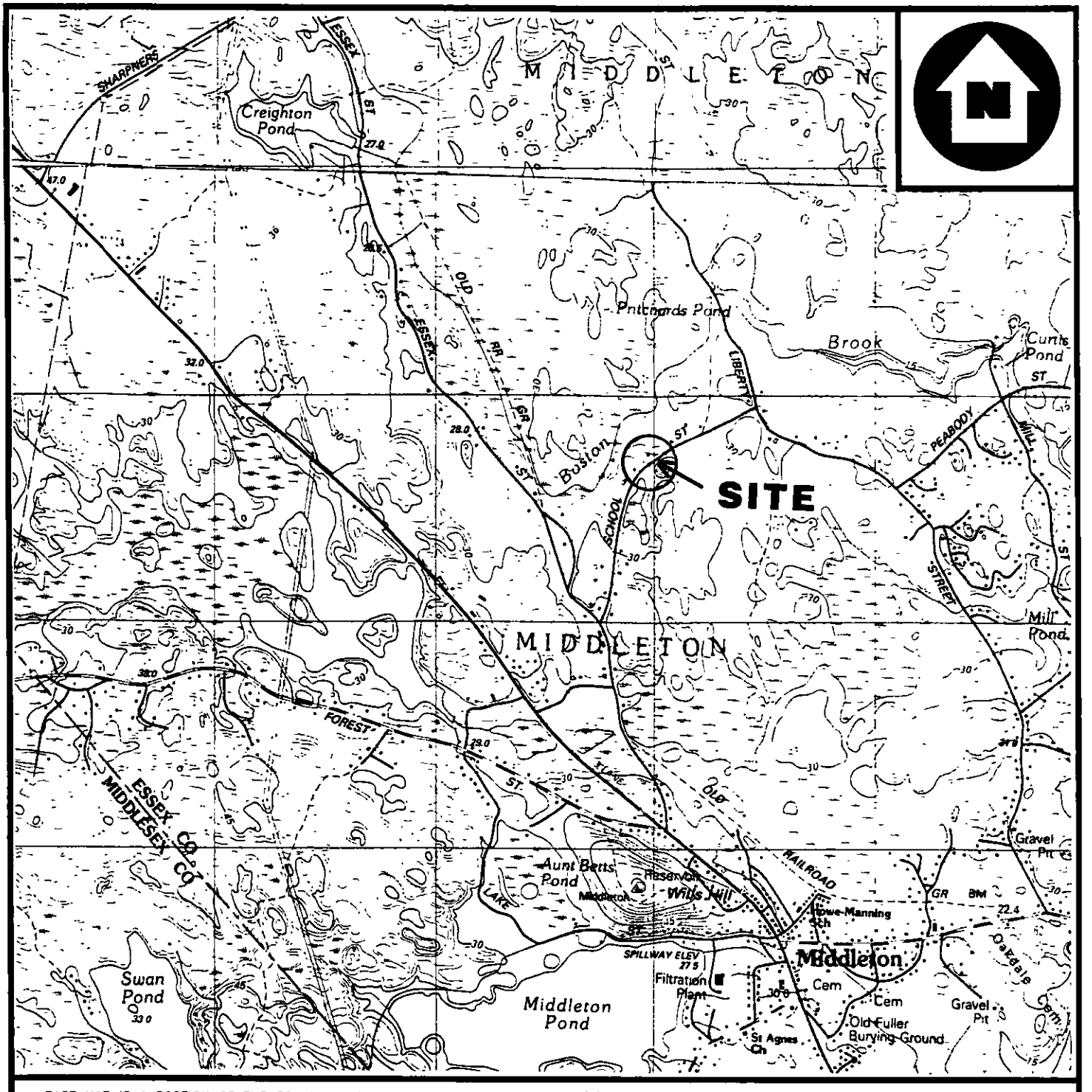
_____

_____	_____	_____	_____
ERRS Response Manager	(Date)	ERRS Safety Manager	(Date)
_____	_____	_____	_____
START Lead	(Date)	START RSO	(Date)
_____	_____	_____	_____
U.S. EPA OSC	(Date)	U.S. EPA Safety Officer	(Date)

APPENDIX B

SITE LOCATION MAP



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15' U.S.G.S. QUADRANGLE(S):
READING AND LAWRENCE, MASS. 1987, FIELD CHECKED 1979, EDITED 1987 - 1:25,000

1 0 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

QUADRANGLE LOCATION

SITE LOCATION MAP

AMERICAN GLUE & RESIN
40 SCHOOL STREET
MIDDLETON, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS

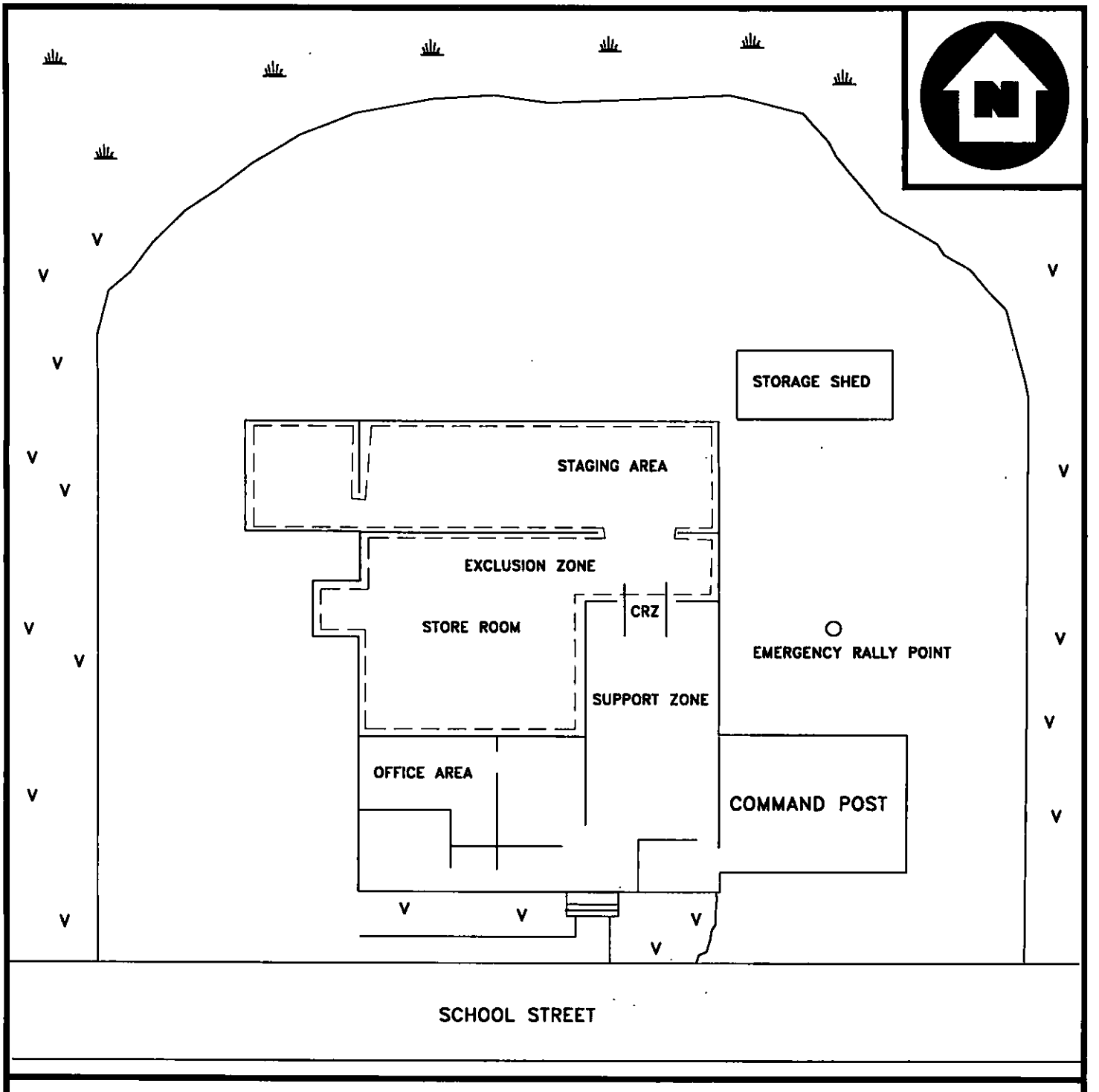
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
98-12-0011	S. AMIRAULT	1/04/99

FILE NAME:	
R:\98120011\FIG1	FIGURE 1

APPENDIX C

SITE DIAGRAM/WORK ZONES



CRZ CONTAMINATION REDUCTION ZONE

V GRASS AREA

WETLAND AREA

NOT TO SCALE

SITE DIAGRAM

AMERICAN GLUE & RESIN
40 SCHOOL STREET
MIDDLETON, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
98-12-0011	S. AMIRAULT	1/04/99

FILE NAME: R:\98120011\FIG2

FIGURE 2

APPENDIX D

CHEMICAL HAZARDS

CHEMICAL DATA SUMMARY:

Name & CAS number: **2-Butanone** 78-93-3

Structure: CH3COCH2CH3
Conversion Factor: 1 ppm = 3.00 mg/m3
RTECS Number: EL6475000
DOT ID and Guide Numbers: 1193 26, 1232 26
SYNONYMS & TRADENAMES:
Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone
IDLH: 3000 ppm
Odor Threshold: 1-30 ppm

==========

NIOSH DATA
TWA: 200 ppm (590 mg/m3)
STEL: 300 ppm (885 mg/m3)
CEILING:
NOTES:
OSHA DATA
TWA: See Appendix G for vacated 1989 OSHA PELS. 200 ppm (590 mg/m3)
STEL:
CEILING:
NOTES:

==========

PHYSICAL DESCRIPTIONS
Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.
INCOMPATIBILITES & REACTIVITES
Strong oxidizers, amines, ammonia, inorganic acids, caustics, copper, isocyanates, pyridines
CHEMICAL & PHYSICAL PROPERTIES
Molecular Weight: 72.1 Vapor Pressure: 78 mmHg
Solubility: 28%
Boiling Point: 175 F
Flash Point: 16 F Freezing Point: -123 F
Upper Explosive Limit: (200 F): 11.4%
Lower Explosive Limit: (200 F): 1.4% Ionization Potential: 9.54 eV
Specific Gravity: 0.81
Flammability: Class IB Flammable Liquid

==========

MEASUREMENT METHODS
Collection Method: Ambersorb XE-347 tube
Sample work-up: Carbon disulfide
Analytical Method: Gas chromatography with flame ionization detection
Reference: NIOSH Manual of Analytical Methods, 3rd edition
Method Number: [#2500]

==========

PERSONAL PROTECTION & SANITATION
Wear appropriate equipment to prevent:
Wear appropriate personal protective clothing to prevent skin contact.
Wear eye protection to prevent:
Wear appropriate eye protection to prevent eye contact
Workers should wash:
The worker should immediately wash the skin when it becomes contaminated.
Work clothing should be changed daily:
No recommendation is made specifying the need for the worker to change clothing after the workshift.
Remove Clothing:
Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point <100 degrees F).
The following equipment should be available:
Eyewash fountains should be provided in areas where there is any possibility
that workers could be exposed to the substances; this is irrespective of the recommendation involving the wearing of eye protection.

==========

RESPIRATOR SELECTION

NIOSH/OSHA RECOMMENDATIONS
*3000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(Substance causes eye irritation or damage; eye protection needed)
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)
(Substance causes eye irritation or damage; eye protection needed)
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
*(Emergency or planned entry into unknown concentrations or IDLH conditions):
(APF = 10,000) Any self-contained breathing apparatus that has a fullfacepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode
*Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask)
with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

==========

ROUTES OF EXPOSURE
SYMPTOMS OF EXPOSURE
Irritation eyes, skin, nose; Headache; Dizziness; Vomiting; Dermatitis
FIRST AID
Eye:If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
Skin: If this chemical contacts the skin, immediately wash the contaminated skin with water. If this chemical penetrates the clothing, immediately remove the clothing and wash the skin with water. If symptoms occur after washing, get medical attention immediately.
Breath: If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Other measures are usually unnecessary.
Swallow: If this chemical has been swallowed, get medical attention immediately.
ORGANS AFFECTED BY EXPOSURE TO THIS SUBSTANCE ARE:
Eyes, skin, Respiratory system, Central Nervous System

==========

SARA REPORTING LEVELS
SECTION 304:
Cercla Reportable Quantity (lbs): 5000
SUBJECT TO SECTION 313:
RCRA Code: U159

CHEMICAL DATA SUMMARY:
Name & CAS number: **Acetone** 67-64-1
Structure: (CH3)2CO
Conversion Factor: 1 ppm = 2.42 mg/m3
RTECS Number: AL3150000
DOT ID and Guide Numbers: 1090 26
SYNONYMS & TRADENAMES:
Dimethyl ketone, Ketone propane, 2-Propanone
IDLH: 2500 ppm [LEL]
Odor Threshold: 3.6-653 ppm

==========

NIOSH DATA
TWA: 250 ppm (590 mg/m3)
STEL:
CEILING:
NOTES:
OSHA DATA
TWA: See Appendix G for vacated 1989 OSHA PELS. 1000 ppm (2400 mg/m3)
STEL:
CEILING:
NOTES:

==========

PHYSICAL DESCRIPTIONS
Colorless liquid with a fragrant, mint-like odor.
INCOMPATIBILITES & REACTIVITES
Oxidizers, acids
CHEMICAL & PHYSICAL PROPERTIES
Molecular Weight: 58.1 Vapor Pressure: 180 mmHg
Solubility: Miscible
Boiling Point: 133F
Flash Point: 0F
Freezing Point: -140F
Upper Explosive Limit: 12.8%
Lower Explosive Limit: 2.5%
Ionization Potential: 9.69 eV
Specific Gravity: 0.79
Flammability: Class IB Flammable Liquid

==========

MEASUREMENT METHODS
Collection Method: Charcoal tube
Sample work-up: Carbon disulfide
Analytical Method: Gas chromatography with flame ionization detection
Reference: NIOSH Manual of Analytical Methods, 3rd edition
Method Number: [#1300, Ketones I]

==========

PERSONAL PROTECTION & SANITATION
Wear appropriate equipment to prevent: Wear appropriate personal protective clothing to prevent skin contact.
Wear eye protection to prevent: Wear appropriate eye protection to prevent eye contact
Workers should wash: The worker should immediately wash the skin when it becomes contaminated.
Work clothing should be changed daily: No recommendation is made specifying the need for the worker to change clothing after the workshift.
Remove Clothing: Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point < 100 degrees F).
The following equipment should be available:
NO RECOMMENDATION GIVEN

==========

RESPIRATOR SELECTION
NIOSH RECOMMENDATIONS
***2500 ppm:**
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s) (Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)
(Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 10) Any supplied-air respirator
(Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
***(Emergency or planned entry into unknown concentrations or IDLH conditions):**
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode
***Escape:**
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

==========

ROUTES OF EXPOSURE
SYMPTOMS OF EXPOSURE
Irritation eyes, nose, throat; Headache, Dizziness, Central Nervous System
Depressant/Depression; Dermatitis
FIRST AID
Eye: If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
Skin: If this chemical contacts the skin, immediately wash the contaminated skin with soap and water. If this chemical penetrates the clothing, immediately remove the clothing, wash the skin with soap and water, and get medical attention promptly.
Breath: If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.
Swallow: If this chemical has been swallowed, get medical attention immediately.
ORGANS AFFECTED BY EXPOSURE TO THIS SUBSTANCE ARE: Eyes, skin, Respiratory system, Central Nervous System

==========

SARA REPORTING LEVELS
SECTION 304:
Cercla Reportable Quantity (lbs): 5000
SUBJECT TO SECTION 313:
RCRA Code: U002

CHEMICAL DATA SUMMARY:

Name & CAS number: **Toluene** 108-88-3

Structure: C6H5CH3
Conversion Factor: 1 ppm = 3.83 mg/m3
RTECS Number: XS5250000
DOT ID and Guide Numbers:
1294 27

SYNONYMS & TRADENAMES:

Methyl benzene, Methyl benzol, Phenyl methane, Toluol
IDLH: 500 ppm
Odor Threshold: 0.16-37 ppm

==========

NIOSH DATA

TWA: 100 ppm (375 mg/m3)
STEL: 150 ppm (560 mg/m3)
CEILING:
NOTES:

OSHA DATA

TWA: See Appendix G for vacated 1989 OSHA PELS. 200 ppm
STEL:
CEILING: 300 ppm 500 ppm (10-minute maximum peak)
NOTES:

==========

PHYSICAL DESCRIPTIONS

Colorless liquid with a sweet, pungent, benzene-like odor.

INCOMPATIBILITES & REACTIVITES

Strong oxidizers

CHEMICAL & PHYSICAL PROPERTIES

Molecular Weight: 92.1 Vapor Pressure: 21 mmHg
Solubility: (74F): 0.07%
Boiling Point: 232F
Flash Point: 40F
Freezing Point: -139F
Upper Explosive Limit: 7.1%
Lower Explosive Limit: 1.1%
Ionization Potential: 8.82 eV
Specific Gravity: 0.87
Flammability: Class IB Flammable Liquid

==========

MEASUREMENT METHODS

Collection Method: Charcoal tube
Sample work-up: Carbon disulfide
Analytical Method: Gas chromatography with flame ionization detection
Reference: NIOSH Manual of Analytical Methods, 3rd edition
Method Number: [#1500, Hydrocarbons]

==========

PERSONAL PROTECTION & SANITATION

Wear appropriate equipment to prevent:
Wear appropriate personal protective clothing to prevent skin contact. Wear eye protection to prevent:
Wear appropriate eye protection to prevent eye contact
Workers should wash: The worker should immediately wash the skin when it becomes contaminated. Work clothing should be changed daily: No recommendation is made specifying the need for the worker to change clothing after the workshift.
Remove Clothing: Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point < 100 degrees F).
The following equipment should be available:
NO RECOMMENDATION GIVEN

==========

RESPIRATOR SELECTION

NIOSH RECOMMENDATIONS

*500 ppm: (APF = 10) Any chemical cartridge respirator with organic vaporcartridge(s) (Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s) (Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 10) Any supplied-air respirator
(Substance reported to cause eye irritation or damage; may require eye protection)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
*(Emergency or planned entry into unknown concentrations or IDLH conditions):
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus
operated in pressure-demand or other positive-pressure mode
*Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister; Any appropriate escape-type, self-contained breathing apparatus

==========

ROUTES OF EXPOSURE

SYMPTOMS OF EXPOSURE

Irritation eyes, nose; Fatigue, Weakness, Confusion; Euphoria, Dizziness, Headache; dilated pupils, Lacrimation; Nervousness, Muscle Fatigue, Insomnia; Paresthesia; Dermatitis; liver, kidney damage

FIRST AID

Eye: If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medicalattention immediately. Contact lenses should not be worn when working with this chemical.

Skin: If this chemical contacts the skin, promptly wash the contaminated skin with soap and water. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with soap and water. Get medical attention promptly.

Breath: If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Swallow: If this chemical has been swallowed, get medical attention immediately.

ORGANS AFFECTED BY EXPOSURE TO THIS SUBSTANCE ARE: Eyes, skin, Respiratory system, Central Nervous System, liver, kidneys

==========

SARA REPORTING LEVELS

SECTION 304:
Cercla Reportable Quantity (lbs): 1000
SUBJECT TO SECTION 313:
RCRA Code: U220

CHEMICAL DATA SUMMARY:
Name & CAS number: **Phosphoric acid** 7664382
Structure: H3PO4
Conversion Factor: 1 ppm = 4.07 mg/m3
RTECS Number: TB6300000
DOT ID and Guide Numbers:
1805 60
SYNONYMS & TRADENAMES:
Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid
IDLH: 1000 mg/m3
Odor Threshold: not given

NIOSH DATA
TWA: 1 mg/m3
STEL: 3 mg/m3
CEILING:
NOTES:
OSHA DATA
TWA: See Appendix G for vacated 1989 OSHA PELS. 1 mg/m3
STEL:
CEILING:
NOTES:

PHYSICAL DESCRIPTIONS
Thick, colorless, odorless, crystalline solid. [Note: Often used in an aqueous
solution.]
INCOMPATIBILITES & REACTIVITES
Strong caustics, most metals [Note: Readily reacts with metals to form flammable hydrogen gas. DO NOT MIX WITH SOLUTIONS CONTAINING BLEACH OR
AMMONIA.]
CHEMICAL & PHYSICAL PROPERTIES
Molecular Weight: 98.0 Vapor Pressure: 0.03 mmHg
Solubility: Miscible
Boiling Point: 415°F
Flash Point: NA
Melting Point: 108°F
Upper Explosive Limit: NA
Lower Explosive Limit: NA
Ionization Potential: ?
Specific Gravity: (77°F): 1.87 (pure) 1.33 (50% soln.)
Flammability:
Noncombustible Liquid

MEASUREMENT METHODS
Collection Method: Silica gel tube (a special coating must be added)
Sample work-up: Sodium bicarbonate/Sodium carbonate
Analytical Method: Ion chromatography
Reference: NIOSH Manual of Analytical Methods, 3rd edition
Method Number: [#7903, Inorganic Acids]

PERSONAL PROTECTION & SANITATION
Wear appropriate equipment to prevent:
Wear appropriate personal protective clothing to prevent skin contact.
Wear eye protection to prevent:
Wear appropriate eye protection to prevent eye contact
Workers should wash:
The worker should immediately wash the skin when it becomes contaminated.
Work clothing should be changed daily:
Workers whose clothing may have become contaminated should change into
uncontaminated clothing before leaving the work premises.
Remove Clothing:
Work clothing that becomes wet or significantly contaminated should be removed
and replaced.
The following equipment should be available:
Eyewash fountains should be provided in areas where there is any possibility
that workers could be exposed to the substances (>1.6%)) Facilities for quickly drenching the body should be provided within the immediate work area
for emergency use where there is a possibility of exposure to the substances
(>1.6%)

RESPIRATOR SELECTION
NIOSH/OSHA RECOMMENDATIONS
*25 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(Substance reported to cause eye irritation or damage; may require eye protection)
*50 mg/m3:
(APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
*1000 mg/m3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
*(Emergency or planned entry into unknown concentrations or IDLH conditions):
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode
*Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter
Any appropriate escape-type, self-contained breathing apparatus

---

ROUTES OF EXPOSURE
SYMPTOMS OF EXPOSURE
Irritation eyes, skin, upper Respiratory System; eye, skin, burns; Dermatitis
FIRST AID
Eye:
If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical
attention immediately. Contact lenses should not be worn when working with
this chemical.
Skin:
If this chemical contacts the skin, immediately flush the contaminated skin
with water. If this chemical penetrates the clothing, immediately remove the
clothing and flush the skin with water. Get medical attention promptly.
Breath:
If a person breathes large amounts of this chemical, move the exposed person
to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.
Swallow:
If this chemical has been swallowed, get medical attention immediately.
ORGANS AFFECTED BY EXPOSURE TO THIS SUBSTANCE ARE:
Eyes, skin, Respiratory system

SARA REPORTING LEVELS
SECTION 304:
Cercla Reportable Quantity (lbs): 5000

SUBJECT TO SECTION 313:

MATERIAL SAFETY DATA SHEET

Para-Chem Southern, Inc.®, PO Box 127, Simpsonville, SC 29681
24 Hour Emergency Telephone: (803) 967-7691

Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: PARAGUM® 146
CHEMICAL FAMILY: Sodium Polyacrylate Thickener

Section 2. HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS

Chemical Name	CAS Number	% by Weight	ACGIH TLV	OSHA PEL
Methanol	67-56-1	2.8%	200 ppm	200 ppm

Section 3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY: Eyes, Skin, Inhalation, and Ingestion.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Respiratory problems.
POTENTIAL HEALTH EFFECTS:
EYE CONTACT: May cause slight irritation.
SKIN CONTACT: May cause slight irritation.
INGESTION: May cause slight irritation to mouth, throat, and digestive system.
INHALATION: May cause slight irritation to throat, nose, and lungs.
CHRONIC: None known.
CARCINOGENICITY: This product contains no ingredient listed as a carcinogen by IARC, NTP, or OSHA.

Section 4. FIRST AID MEASURES

EYE CONTACT: Flush with water for 15 minutes. Call physician if irritation occurs.
SKIN CONTACT: Wash with soap and water.
INGESTION: To conscious person, give two glasses of water. Induce vomiting and call physician immediately.
INHALATION: Move person to fresh air.

Section 5. FIRE-FIGHTING MEASURES

FLASH POINT (°)F: None.
FIRE-FIGHTING INSTRUCTIONS: Water for dried material. Use protective clothing and self-contained breathing apparatus.

MATERIAL SAFETY DATA SHEET

DECOMPOSITION PRODUCTS: Dried material may produce CO, CO_2, H_2O, Na_2O, and fumes from chemicals in Section II.

SECTION 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Dispense sand, sawdust, or vermiculite. Collect and place in waste container. Wash area thoroughly with water.

SECTION 7. HANDLING AND STORAGE

HANDLING: Use good hygienic practices. (Wash hands before eating, using washroom, or smoking.) Do not take internally. Methanol cannot be made non-poisonous.
STORAGE: Store above 40°F.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT:
EYE/FACE PROTECTION: Wear splash goggles if contact with material is likely.
SKIN PROTECTION: Wear gloves goggles if contact with material is likely.
RESPIRATORY PROTECTION: Not normally required with good ventilation.
ENGINEERING CONTROLS: Normal room ventilation.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT (°F): 212
SPECIFIC GRAVITY (WATER = 1): 1.1
VAPOR PRESSURE: Same as water.
VAPOR DENSITY(air=1): Same as water.
% VOLATILE BY WEIGHT: 87.5
pH: 8.2
APPEARANCE AND ODOR: Light clear yellow viscous liquid with little or no odor.

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.
POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: None known.
HAZARDOUS DECOMPOSITION PRODUCTS: None.

MATERIAL SAFETY DATA SHEET

SECTION 11. TOXICOLOGICAL INFORMATION

No information available.

SECTION 12. ECOLOGICAL INFORMATION

No information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposed of in accordance with federal, state and local regulations.

SECTION 14. TRANSPORT INFORMATION

For domestic transportation purpose, this product is not designated as a hazardous material by the U.S. Department Of Transportation.

SECTION 15. REGULATORY INFORMATION

TSCA: This product is listed with TSCA.
CERCLA:

Chemical Name	RQ
Methanol	5,000 lbs.

SARA TITLE III:
Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
[X]	[ ]	[ ]	[ ]	[ ]

Section 313 Chemicals:

Chemical Name	CAS#	% by Weight
Methanol	67-56-1	2.8%

SECTION 16. OTHER INFORMATION

HMIS RATINGS: Health = 0 Flammability = 1
Reactivity = 0 Personal Protective Equipment = B
Hazard rating scale: 0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe

MATERIAL SAFETY DATA SHEET

Para-Chem Southern, Inc. believes the statements, technical information and recommendations contained herein are reliable. They are given without warranty or guarantee of any kind, expressed or implied.

DATE ISSUED: July 10, 1993

PREPARED BY: B. L. Eudy

MATERIAL SAFETY DATA SHEET

SECTION 1 - MATERIAL IDENTIFICATION

PRODUCT NAME	FLEXBOND* 149 EMULSION *FLEXBOND is a trademark of Air Products and Chemicals, Inc.
PRODUCT CODE	F-149
MSDS REVISION NUMBER	6
MANUFACTURER	Air Products Polymers, L. P. 7201 Hamilton Blvd., Allentown, PA 18195-1501
TELEPHONE NUMBER	800-345-3148
EMERGENCY TELEPHONE NUMBER(S)	800-523-9374 (Continental U.S.) 610-481-7711 (Outside Continental U.S.)
DATE PREPARED	JUNE 1998

****

EMERGENCY OVERVIEW

****

HMIS HEALTH RATING 1 FLAMMABILITY 0 REACTIVITY 0

PHYSICAL FORM	Mobile liquid
COLOR	White
ODOR	Sweet
HAZARDS	Mild respiratory tract irritant. Mild skin irritant.
EXTINGUISHING MEDIA	The product will only burn after the water it contains is driven off.

****

C.A.S. - CHEMICAL NAME	Mixture
SYNONYMS	None
CHEMICAL FAMILY	Polyvinyl Acetate Emulsions
EMPIRICAL FORMULA	Mixture
INTENDED USE	No Data
REVISION NOTES	None

SECTION 2 - INGREDIENTS

#	%	CAS Number and Chemical Name
1.	30.00 - 50.00	7732-18-5 Water
2.	<0.30	108-05-4 Vinyl Acetate Monomer
3.	<0.03	50-00-0 Formaldehyde

The remaining components are trade secret.

OSHA (ACGIH) EXPOSURE LIMITS

		TWA ppm	TWA mg/m3	STEL ppm	STEL mg/m3	Ceiling ppm	Ceiling mg/m3
1.	OSHA	N/E	N/E	N/E	N/E	N/E	N/E
	ACGIH	N/E	N/E	N/E	N/E	N/E	N/E
2.	OSHA	10.0000	30.0000	20.0000	60.0000	N/E	N/E
	ACGIH	10.0000	35.0000	15.0000	53.0000	N/E	N/E
3.	OSHA	0.7500	N/E	2.0000	N/E	N/E	N/E
	ACGIH	N/E	N/E	N/E	N/E	0.3000	0.3700

N/E = Not Established.

SECTION 3 - HEALTH HAZARDS

ROUTES OF EXPOSURE

Eye Contact
Skin Contact
Ingestion
Inhalation

EXPOSURE STANDARDS

Other: Formaldehyde Celanese TWA = 1.0000 ppm
Vinyl Acetate Monomer Dupont TWA = 10.0000 ppm
Formaldehyde concentrations in the workplace air may exceed the TLV under certain conditions of use. Under normal conditions of use in a well ventilated space, the concentration of minor components in the workplace air will not exceed the TLV or PEL. See Section 2 for exposure standards on ingredients. Maintain air contaminant concentrations in the workplace at the lowest feasible levels. Minor components will migrate into the container headspace. Levels in excess of the TLV's or PEL's can accumulate in non-vented container headspaces. Open drums in a well ventilated space. The principal volatile component is water. Minor volatile components are identified in Section 2 "Ingredients".

HEALTH HAZARDS
Mild respiratory tract irritant.
Mild skin irritant.

TARGET ORGANS
None known

SIGNS AND SYMPTOMS OF EXPOSURE (Acute effects)
Contact with skin causes mild irritation and discomfort. Inhalation of mists may cause irritation in the respiratory tract. Inhalation of vapors may cause irritation in the respiratory tract.

SIGNS AND SYMPTOMS OF EXPOSURE (Possible Longer Term Effects)
Repeated and/or prolonged exposure to low concentrations of vapor may cause: sore throat which are transient.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
None known

CARCINOGENS UNDER OSHA, ACGIH, NTP, IARC, OTHER
Vinyl Acetate Monomer (IARC)

SECTION 4 - FIRST AID

EYE CONTACT
Rinse immediately with plenty of water.

SKIN CONTACT
Wash affected area with soap and water. Remove contaminated clothing and shoes.

INHALATION
Move patient to fresh air. If breathing has stopped or is labored give assisted respiration (e.g. mouth-to-mouth). Prevent aspiration of vomit. Turn victim's head to the side. Seek medical advice.

INGESTION
If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE AND EXPLOSION DATA

FLASH POINT (closed cup)	No Data
UPPER EXPLOSION LIMIT (UEL)	No Data
LOWER EXPLOSION LIMIT (LEL)	No Data

AUTOIGNITION TEMPERATURE No Data
FIRE HAZARD CLASSIFICATION (OSHA/NFPA)
Non-Combustible

EXTINGUISHING MEDIA
The product will only burn after the water it contains is driven off. For dry polymer use water or carbon dioxide. Product does not burn. Aqueous solution is not flammable.

SPECIAL FIRE FIGHTING PROCEDURES
No special procedures required. The product, as distributed, is noncombustible.

UNUSUAL FIRE AND EXPLOSION HAZARDS
When dried polymer burns, water (H2O), carbon dioxide (CO2), carbon monoxide (CO) and smoke are produced.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

CONTAINMENT TECHNIQUES (Removal of ignition sources, diking etc)
Stop the leak, if possible. Ventilate the space involved. Construct a dike to prevent spreading.

CLEAN-UP PROCEDURES
If recovery is not feasible, admix with dry soil, sand or non-reactive absorbent and place in a container or dumpster pending disposal. Transfer to containers by suction, preparatory for later disposal. Place in metal containers for recovery or disposal. Flush area with water spray. Wash contaminated property (e.g., automobiles) quickly before the material dries. Clean-up personnel must be equipped with self contained breathing apparatus and butyl rubber protective clothing. For large spills, recover spilled material with a vacuum truck.

OTHER EMERGENCY ADVICE
Spilled polymer emulsion is very slippery. Use care to avoid falls. A film will form on drying. Remove saturated clothing and wash contacted skin area with soap and water. Product imparts a milky white color to contaminated waters. Foaming may result. Sewage treatment plants may not be able to remove the white color imparted to the water. Wear protective clothing, boots, gloves, and eye protection.

SECTION 7 - HANDLING AND STORAGE

STORAGE
Keep away from: oxidizers. Avoid freezing temperatures during storage. Minimize contact with atmospheric air to prevent inoculation with microorganisms.

HANDLING
Avoid contact with skin or eyes. Avoid breathing of vapors. Handle in well ventilated work space. When handling, do not eat, drink, or smoke.

OTHER PRECAUTIONS
Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations (e.g. OSHA).

SECTION 8 - PERSONAL PROTECTION / EXPOSURE CONTROLS

EYE PROTECTION
Chemical safety glasses.

HAND PROTECTION
Rubber Gloves.

RESPIRATORY PROTECTION
Not required under normal conditions in a well-ventilated workplace. An organic vapor respirator National Institute for Occupational Safety and Health (NIOSH) approved for organic vapors is recommended under emergency conditions.

PROTECTIVE CLOTHING
Long sleeved clothing.

ENGINEERING CONTROLS
Maintain air concentrations in work spaces in accord with standards outlined in Sections 2 and 3.

WORK AND HYGIENIC PRACTICES
Provide readily accessible eye wash stations and safety showers.

SECTION 9 - TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM	Mobile liquid
COLOR	White
ODOR	Sweet
pH	5.25
VAPOR PRESSURE (mm Hg at 21C (70F))	18.52
VAPOR DENSITY (Air = 1)	of water vapor
BOILING POINT	>100.00 C (>212.00 F)
MELTING POINT	No Data
SOLUBILITY IN WATER	Completely (100%)
SPECIFIC GRAVITY (Water = 1)	1.02
MOLECULAR WEIGHT	Mixture

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY
Stable at ambient temperatures. Coagulation may occur following freezing, thawing or boiling.

CONDITIONS TO AVOID (if unstable)
Not applicable

INCOMPATABILITY (Materials to Avoid)
Mineral acids (i.e. sulfuric, phosphoric, etc.). Alkalis (i.e. Sodium or Potassium Hydroxide etc.).

HAZARDOUS DECOMPOSITION PRODUCTS (from burning, heating, or reaction with other materials).
Depending upon formulation conditions (such as pH), the level of acetaldehyde may increase as a result of hydrolysis of residual vinyl acetate monomer. Carbon Monoxide in a fire. Carbon Dioxide in a fire. Acetic Acid.

HAZARDOUS POLYMERIZATION
Will not occur

CONDITIONS TO AVOID (if polymerization may occur)
Not applicable

SECTION 11 - TOXICOLOGICAL PROPERTIES

ACUTE ORAL TOXICITY (LD50, RAT)
No Data

ACUTE DERMAL TOXICITY (LD50, RABBIT)
No Data

ACUTE INHALATION TOXICITY (LC50, RAT)
No Data

OTHER ACUTE EFFECTS
No Data

IRRITATION EFFECTS DATA
Mild irritant to the skin of a rabbit. Non-irritant to the eyes of a rabbit.

CHRONIC/SUBCHRONIC DATA
Although formaldehyde is a minor volatile component of this product, it is important to recognize that recent test results have shown formaldehyde to cause cancer in laboratory animals. Formaldehyde is readily detected due to its irritant properties. The odor detection level varies among different individuals between 0.2 to 1 ppm. In addition, acclimation will occur from

repeated exposure but sensitivity returns following rest periods away from the atmospheres containing formaldehyde. Whether a risk exists at levels below the odor threshold has not been determined. This product contains small amounts of vinyl acetate monomer. ACGIH evaluated vinyl acetate (1993) as an A3 - Animal Carcinogen:.....Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes of exposure. The International Agency for Research on Cancer (IARC) published a monograph on vinyl acetate (1995). In this monograph IARC indicates "there is inadequate evidence in humans for carcinogenicity of vinyl acetate. There is limited evidence in experimental animals for carcinogenicity of vinyl acetate." Normally, this lack of conclusive evidence would place a substance in the IARC Category 3 classification (Not classified as a human carcinogen). However, because vinyl acetate is metabolized to acetaldehyde, which has an IARC 2B (Possibly carcinogenic to humans) classification, it also has been listed under Category 2B. This product has been tested and shown not to cause sensitization in guinea pigs.

SECTION 12 - ECOLOGICAL INFORMATION

A large quantity of material spilled in the presence of rainfall could cause the spill to travel long distances or reach waterways. Once emulsion is spilled into water, methods of removal or neutralization can cause more harm to the aquatic system than if no action is taken.

Additional Information

A large quantity of material spilled in the presence of rainfall could cause the spill to travel long distances or reach waterways. Once emulsion is spilled into water, methods of removal or neutralization can cause more harm to the aquatic system than if no action is taken.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Comply with all Federal, State and Local Regulations. For small quantities (less than 100 gallons): Disposal to municipal or industrial wastewater treatment plants is normally acceptable. Obtain approval from these authorities before disposal. The product does impart a white, milky color to water, which may not be removed or sufficiently diluted by the treatment facility. The product may also cause foaming when agitated. The product can be chemically or biologically degraded. For large quantities: Disposal through licensed waste disposal facilities is suggested. The product can be incinerated, though chemical or biological treatment is sufficient. Chemical precipitation/coagulation can be used to facilitate removal of solids (consult manufacturer for detailed procedure). NOTE: As supplied or diluted, product material (foam included), when

splashed on automobiles or other personal property, is difficult to remove if allowed to dry.

SECTION 14 - TRANSPORT INFORMATION

DOT NON-BULK SHIPPING NAME	RESIN COMPOUND - Not DOT Regulated // Keep From Freezing
DOT BULK SHIPPING NAME	Refer to Air Products Bill of Lading.
IMO SHIPPING DATA	Refer to Air Products Bill of Lading.
ICAO/IATA SHIPPING DATA	RESIN COMPOUND - Not IATA Regulated // Keep From Freezing

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SECTION 15 - REGULATORY INFORMATION

US FEDERAL REGULATIONS

TOXIC SUBSTANCES CONTROL ACT (TSCA)-
All components are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

OSHA Hazard Communication Standard (29CFR1910.1200) hazard class(es)
None

EPA SARA Title III Section 312 (40CFR370) hazard class
None

EPA SARA Title III Section 313 (40CFR372) toxic chemicals above "de minimis" level are
Vinyl Acetate Monomer

STATE REGULATIONS

PROPOSITION 65 SUBSTANCES (component(s) known to the State of California to cause cancer and/or reproductive toxicity and subject to warning and discharge requirements under the "Safe Drinking Water and Toxic Enforcement Act of 1986")
Formaldehyde

NEW JERSEY TRADE SECRET REGISTRY NUMBER(S)
05995500-(F-149)

SECTION 16 - INTERNATIONAL REGULATIONS

CANADA

DSL
Included on Inventory.

WHMIS HAZARD CLASSIFICATION
None
WHMIS TRADE SECRET REGISTRY NUMBER(S)
None
WHMIS SYMBOLS
None

EUROPEAN ECONOMIC COMMUNITY (EEC)
EINECS/ELINCS MASTER INVENTORY
Not determined
EEC RISK (R) PHRASES
There are no known health hazards.
EEC SPECIAL PHRASES
Keep liquid resins above freezing.

25-1010

January 20, 1999

*** MATERIAL SAFETY DATA SHEET ***

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER..... 25-1010
PRODUCT NAME..... DUR-O-SET(R) C325

National Starch & Chemical Company
P.O. Box 6500, Finderne Avenue
Bridgewater, NJ 08807
USA
Emergency Telephone:
908-685-5000 (24 hours)

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY..... Vinyl Acetate Homopolymer

NONE HAZARDOUS

3. HAZARDS IDENTIFICATION

Not considered as hazardous.

EYE.....	Slightly irritating but does not injure eye tissue.
SKIN CONTACT.....	Frequent or prolonged contact may irritate the skin.
INHALATION.....	Vapors may be irritating to respiratory system and nasal passages.
INGESTION.....	Irritating to mouth, throat and stomach. May cause gastric tract disorder and/or damage. Low order of toxicity.

4. FIRST-AID MEASURES

EYE.....	Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

*** MATERIAL SAFETY DATA SHEET ***

4. FIRST-AID MEASURES (Continued)

SKIN CONTACT.....	Flush with large amounts of water; use soap if available.
INHALATION.....	Remove to fresh air. Get medical attention if irritation persists.
INGESTION.....	Treat symptomatically and supportively. Get medical attention. DO NOT attempt to give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

AUTOIGNITION.....	Not Applicable
FLASH POINT.....	>200 F
EXTINGUISHING MEDIA.....	Water fog; Foam; CO2; Dry chemical
SPECIAL FIREFIGHTING PROCEDURES....	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes
FIRE & EXPLOSION HAZARDS.....	This is a water-based product and presents no particular fire or explosion hazard. Dry polymer film will burn. Product contains low level of organic volatiles which may be emitted at elevated temperatures.
HAZARDOUS COMBUSTION PRODUCTS.....	Carbon monoxide, carbon dioxide, unknown hydrocarbons.
UPPER EXPLOSION LIMIT (%).....	Not Applicable
LOWER EXPLOSION LIMIT (%).....	Not Applicable
NFPA FLAMMABILITY HAZARD CLASS.....	0 = Insignificant

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES.....	Spills should be taken up with suitable absorbent and placed in containers. Spill area can be washed with water; collect wash water for approved disposal. Do not flush to storm sewer or waterway.

For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE.....	Ambient.
HANDLING/STORAGE.....	Avoid extreme temperatures. Protect from freezing. This material should not be spilled, discharged, or flushed into sewers or public waterways. Product contains low level of organic volatiles which could accumulate in the unvented headspace of drums or bulk storage vessels. Open drums in well ventilated area. Avoid breathing vapors.
VENTILATION REQUIREMENTS.....	Local
SENSITIVITY TO STATIC ELECTRICITY..	No
SENSITIVITY TO MECHANICAL IMPACT...	No

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION REQUIREMENTS.....	Local
EYE PROTECTION REQUIREMENTS.....	Wear safety glasses with side shields. Protect against splashing.
GLOVE REQUIREMENTS.....	The use of chemically resistant gloves is recommended.
CLOTHING REQUIREMENTS.....	Uniforms, coveralls, or a lab coat should be worn. Rubber boots and apron if exposure is severe.
CHANGE/REMOVAL OF CLOTHING.....	Remove contaminated clothing and launder before reuse.
WASH REQUIREMENTS.....	Wash exposed areas with soap and water.
RESPIRATOR REQUIREMENTS.....	None required under normal handling conditions. Use NIOSH approved respirator if vapor or mist levels are irritating.

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE.....	Mixture
PHYSICAL FORM.....	Liquid
APPEARANCE/ODOR.....	White; Slight odor
ODOR THRESHOLD.....	Not available.
PH AS IS.....	4.5-5.5

9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)

BOILING POINT	212 F
MELTING/FREEZING POINT	32 F
SOLUBILITY IN WATER	Miscible
PARTITION COEFFICIENT (n-octanol/water)	Not Applicable
SPECIFIC GRAVITY (WATER=1)	1.100
BULK DENSITY	9.16 lbs/gal
EVAPORATION RATE	1 (Water)
VAPOR PRESSURE (mmHg)	17 (20 C)
VAPOR DENSITY (air = 1)	0.62
VISCOSITY	2200 cps
VOLATILES	44% (water)
VOLATILE ORGANIC COMPOUNDS	<1 gm/l
AUTOIGNITION	Not Applicable
FLASH POINT	>200 F
OXIDIZING PROPERTIES	Not Applicable

10. STABILITY AND REACTIVITY

STABILITY	Stable
MATERIALS TO AVOID	Substances which react with water.
NFPA REACTIVITY HAZARD CLASS	0 = Insignificant
HAZARDOUS DECOMPOSITION PRODUCTS	Stable under normal temperature and pressure. Product contains low level of organic volatiles which may be emitted or released in application processes involving the use of heat. Vent all ovens and process vessels to the outside atmosphere.

11. TOXICOLOGICAL INFORMATION

PRODUCT TOXICOLOGY

PRODUCT INFORMATION	Although this product has not been tested for chronic effects, it is judged as having a low order of toxicity based on component information. Use of good industrial hygiene practices is recommended.

11. TOXICOLOGICAL INFORMATION (Continued)

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

ROUTE OF ENTRY.....	Inhalation; Ingestion; Skin contact; Eye contact
EFFECTS OF CHRONIC EXPOSURE.....	Not established.
TARGET ORGANS.....	Not Applicable
CARCINOGEN.....	No.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS.....	Waste disposal should be in accordance with existing federal, state and local environmental regulations.
EMPTY CONTAINER WARNINGS.....	Empty containers may contain product residue;follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

DOT INFORMATION.....	Not Applicable

15. REGULATORY INFORMATION

TSCA.....	All components are on the TSCA inventory.
FDA.....	21CFR175.105; 21CFR176.170(B)-Subject to extraction requirements of the regulation; 21CFR176.180
STATE LAWS.....	California Proposition 65; WARNING: This product contains a chemical known to the state of California to

15. REGULATORY INFORMATION (Continued)

	cause cancer: Acetaldehyde (75-07-0), <0.1%.
SARA/TITLE III.....	This product contains no substances at or above the reporting threshold under Section 313, based on data available.

The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.

16. OTHER INFORMATION

MSDS DATE.....	January 13, 1999
CHANGES SINCE PREVIOUS ISSUE.....	Section 3; Section 4; Section 5; Section 7

FOR REGULATORY INFORMATION, CONTACT:

James A. Kocsis
Regulatory Coordinator
Specialty Synthetic Polymers Division
National Starch & Chemical Company
Finderne Avenue, P.O. Box 6500
Bridgewater, NJ 08807
USA
Telephone: 908-707-3750
FAX: 908-685-7073

*** MATERIAL SAFETY DATA SHEET ***

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER..... 78-6369
PRODUCT NAME..... DUR-O-SET E-140

National Starch & Chemical Company
P.O. Box 6500, Finderne Avenue
Bridgewater, NJ 08807
USA
Emergency Telephone:
908-685-5000 (24 hours)

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY..... Ethylene/Vinyl Acetate Copolymer

COMPONENT	CAS NUMBER	CONCENTRATION RANGES (%)
Vinyl acetate	108-05-4	<0.5

3. HAZARDS IDENTIFICATION

Not considered as hazardous.

EYE..... Slightly irritating but does not injure eye tissue.
SKIN CONTACT..... Frequent or prolonged contact may irritate the skin.
INHALATION..... Vapors may be irritating to respiratory system and nasal passages.
INGESTION..... No hazard in normal industrial use. Low order of toxicity.

4. FIRST-AID MEASURES

EYE..... Flush eyes with large amounts of water until irritation subsides. If

4. FIRST-AID MEASURES (Continued)

	irritation persists, get medical attention.
SKIN CONTACT.....	Flush with large amounts of water; use soap if available.
INHALATION.....	Remove to fresh air. Get medical attention if irritation persists.
INGESTION.....	If swallowed, induce vomiting only if victim is alert. Get prompt medical attention. DO NOT attempt to give anything by mouth to a drowsy or unconscious person.

5. FIREFIGHTING MEASURES

AUTOIGNITION.....	N/A
FLASH POINT.....	>220 F
EXTINGUISHING MEDIA.....	Water fog; Foam; Alcohol foam; CO2; Dry chemical
SPECIAL FIREFIGHTING PROCEDURES....	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes
FIRE & EXPLOSION HAZARDS.....	Dry polymer film will burn. Product contains low level of organic volatiles which may be emitted at elevated temperatures.
UPPER EXPLOSION LIMIT (%).....	Not Applicable
LOWER EXPLOSION LIMIT (%).....	Not Applicable
NFPA FLAMMABILITY HAZARD CLASS.....	0 = Insignificant

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES.....	Spills should be taken up with suitable absorbent and placed in containers. Spill area can be washed with water; collect wash water for approved disposal. Do not flush to storm sewer or waterway.

For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE.....	Ambient.
HANDLING/STORAGE.....	Product contains low level of organic volatiles which could accumulate in the unvented headspace of drums or bulk storage vessels. Open drums in well ventilated area. Avoid breathing vapors.
VENTILATION REQUIREMENTS.....	Local
OTHER PRECAUTIONS.....	Avoid extreme temperatures. Protect from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	EXPOSURE LIMITS
Vinyl acetate	10 ppm (ACGIH-TWA) 15 ppm (ACGIH-STEL) 10 ppm (OSHA-PEL) 20 ppm (OSHA-STEL)

VENTILATION REQUIREMENTS.....	Local
EYE PROTECTION REQUIREMENTS.....	Wear safety glasses with side shields.
GLOVE REQUIREMENTS.....	The use of chemically resistant gloves is recommended.
CLOTHING REQUIREMENTS.....	Rubber boots and apron if exposure is severe.
CHANGE/REMOVAL OF CLOTHING.....	Soiled clothing should be laundered before re-use.
WASH REQUIREMENTS.....	Soap and water.
RESPIRATOR REQUIREMENTS.....	None required under normal handling conditions. Use NIOSH approved respirator if vapor or mist levels are irritating.

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE.....	Mixture
PHYSICAL FORM.....	Liquid
APPEARANCE/ODOR.....	Milk white aqueous emulsion, sweet

9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)

	odor.
ODOR THRESHOLD	Not available.
PH AS IS	4.5
BOILING POINT	212 F
MELTING/FREEZING POINT	32 F
SOLUBILITY IN WATER	Miscible
PARTITION COEFFICIENT (n-octanol/water)	Not Applicable
SPECIFIC GRAVITY (WATER=1)	1.060
BULK DENSITY	8.83 lbs/gal
EVAPORATION RATE	1 (Water)
VAPOR PRESSURE (mmHg)	17 (20 C)
VAPOR DENSITY (air = 1)	0.62
VISCOSITY	2300 cps
VOLATILES	45% (water)
VOLATILE ORGANIC COMPOUNDS	<5 g/l
AUTOIGNITION	N/A
FLASH POINT	>220 F
OXIDIZING PROPERTIES	Not Applicable

10. STABILITY AND REACTIVITY

STABILITY	Stable
MATERIALS TO AVOID	Substances which react with water.
NFPA REACTIVITY HAZARD CLASS	0 = Insignificant
HAZARDOUS DECOMPOSITION PRODUCTS	Stable under normal temperature and pressure. Product contains low level of organic volatiles which may be emitted or released in application processes involving the use of heat. Vent all ovens and process vessels to the outside atmosphere.

11. TOXICOLOGICAL INFORMATION

PRODUCT TOXICOLOGY

PRODUCT INFORMATION	Product may contain small amounts of residual vinyl acetate. Vinyl acetate vapors have been shown to cause tumors in the respiratory

11. TOXICOLOGICAL INFORMATION (Continued)

tract of laboratory animals exposed to 600 ppm over a lifetime; 200 ppm caused irritation; 50 ppm produced no observable effect. There is no evidence of adverse effects to humans exposed to levels at or below the ACGIH TLV. Although this product has not been tested for chronic effects, it is judged as having a low order of toxicity based on component information.

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

ROUTE OF ENTRY.....	Inhalation; Skin contact; Eye contact
EFFECTS OF CHRONIC EXPOSURE.....	None known.
TARGET ORGANS.....	Not Applicable
CARCINOGEN.....	No.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS.....	Waste disposal should be in accordance with existing federal, state and local environmental regulations.
EMPTY CONTAINER WARNINGS.....	Empty containers may contain product residue;follow MSDS and label warnings even after they have been emptied.

*** MATERIAL SAFETY DATA SHEET ***

14. TRANSPORTATION INFORMATION

DOT INFORMATION..... Not Applicable

15. REGULATORY INFORMATION

TSCA.....	All components are on the TSCA inventory.
STATE LAWS.....	California Proposition 65 - This product contains Acetaldehyde CAS# 75-07-0, present at less than 0.1%.,
SARA/TITLE III.....	This product contains no substances at or above the reporting threshold under Section 313, based on data available.

The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.

16. OTHER INFORMATION

MSDS DATE..... May 24, 1997

FOR REGULATORY INFORMATION, CONTACT:

James A. Kocsis
Regulatory Coordinator
Specialty Synthetic Polymers Division
National Starch & Chemical Company
Finderne Avenue, P.O. Box 6500
Bridgewater, NJ 08807
USA
Telephone: 908-707-3750
FAX: 908-685-7073

25-1800

January 20, 1999

*** MATERIAL SAFETY DATA SHEET ***

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER..... 25-1800
PRODUCT NAME..... DUR-O-SET E-200

National Starch & Chemical Company
P.O. Box 6500, Finderne Avenue
Bridgewater, NJ 08807
USA
Emergency Telephone:
908-685-5000 (24 hours)

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY..... Ethylene/Vinyl Acetate Copolymer

NONE HAZARDOUS

3. HAZARDS IDENTIFICATION

Not considered as hazardous.

EYE.....	Slightly irritating but does not injure eye tissue.
SKIN CONTACT.....	Frequent or prolonged contact may irritate the skin.
INHALATION.....	Vapors may be irritating to respiratory system and nasal passages.
INGESTION.....	No hazard in normal industrial use. Low order of toxicity.

4. FIRST-AID MEASURES

EYE.....	Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.
SKIN CONTACT.....	Flush with large amounts of water; use soap if available.

4. FIRST-AID MEASURES (Continued)

INHALATION.....	Remove to fresh air. Get medical attention if irritation persists.
INGESTION.....	If swallowed, induce vomiting only if victim is alert. Get prompt medical attention. DO NOT attempt to give anything by mouth to a drowsy or unconscious person.

5. FIREFIGHTING MEASURES

AUTOIGNITION.....	N/A
FLASH POINT.....	>220 F
EXTINGUISHING MEDIA.....	Water fog; Foam; Alcohol foam; CO2; Dry chemical
SPECIAL FIREFIGHTING PROCEDURES....	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes
FIRE & EXPLOSION HAZARDS.....	Dry polymer film will burn. Product contains low level of organic volatiles which may be emitted at elevated temperatures.
UPPER EXPLOSION LIMIT (%).....	Not Applicable
LOWER EXPLOSION LIMIT (%).....	Not Applicable
NFPA FLAMMABILITY HAZARD CLASS....	0 = Insignificant

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES.....	Spills should be taken up with suitable absorbent and placed in containers. Spill area can be washed with water; collect wash water for approved disposal. Do not flush to storm sewer or waterway.

For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	Ambient.
HANDLING/STORAGE	Product contains low level of organic volatiles which could accumulate in the unvented headspace of drums or bulk storage vessels. Open drums in well ventilated area. Avoid breathing vapors.
VENTILATION REQUIREMENTS	Local
OTHER PRECAUTIONS	Avoid extreme temperatures. Protect from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION REQUIREMENTS	Local
EYE PROTECTION REQUIREMENTS	Wear safety glasses with side shields.
GLOVE REQUIREMENTS	The use of chemically resistant gloves is recommended.
CLOTHING REQUIREMENTS	Rubber boots and apron if exposure is severe.
CHANGE/REMOVAL OF CLOTHING	Soiled clothing should be laundered before re-use.
WASH REQUIREMENTS	Soap and water.
RESPIRATOR REQUIREMENTS	None required under normal handling conditions. Use NIOSH approved respirator if vapor or mist levels are irritating.

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Liquid
APPEARANCE/ODOR	White; Slight odor
ODOR THRESHOLD	Not available.
PH AS IS	4.5
BOILING POINT	212 F
MELTING/FREEZING POINT	32 F
SOLUBILITY IN WATER	Miscible
PARTITION COEFFICIENT (n-octanol/water)	Not Applicable
SPECIFIC GRAVITY (WATER=1)	1.060
BULK DENSITY	8.83 lbs/gal

*** MATERIAL SAFETY DATA SHEET ***

9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)

EVAPORATION RATE	1 (Water)
VAPOR PRESSURE (mmHg)	17 (20 C)
VAPOR DENSITY (air = 1)	0.62
VISCOSITY	2000 cps
VOLATILES	45% (water)
VOLATILE ORGANIC COMPOUNDS	<1 gm/l
AUTOIGNITION	N/A
FLASH POINT	>220 F
OXIDIZING PROPERTIES	Not Applicable

10. STABILITY AND REACTIVITY

STABILITY	Stable
MATERIALS TO AVOID	Substances which react with water.
NFPA REACTIVITY HAZARD CLASS	0 = Insignificant
HAZARDOUS DECOMPOSITION PRODUCTS	Stable under normal temperature and pressure. Product contains low level of organic volatiles which may be emitted or released in application processes involving the use of heat. Vent all ovens and process vessels to the outside atmosphere.

11. TOXICOLOGICAL INFORMATION

PRODUCT TOXICOLOGY

PRODUCT INFORMATION	This product is considered as being non-toxic. Use of good industrial hygiene practices is recommended.

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

ROUTE OF ENTRY	Inhalation; Skin contact; Eye contact
EFFECTS OF CHRONIC EXPOSURE	Not established.
TARGET ORGANS	Not Applicable
CARCINOGEN	No.

*** MATERIAL SAFETY DATA SHEET ***

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS.....	Waste disposal should be in accordance with existing federal, state and local environmental regulations.
EMPTY CONTAINER WARNINGS.....	Empty containers may contain product residue;follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

DOT INFORMATION.....	Not Applicable

15. REGULATORY INFORMATION

TSCA.....	All components are on the TSCA inventory.
FDA.....	21CFR175.105; 21CFR176.170(B)-Subject to extraction requirements of the regulation; 21CFR176.180
STATE LAWS.....	California Proposition 65: WARNING: This product contains a chemical known to the state of California to cause cancer: Acetaldehyde (75-07-0), <0.1%.
SARA/TITLE III.....	This product contains no substances at or above the reporting threshold under Section 313, based on data available.

The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product

*** MATERIAL SAFETY DATA SHEET ***

15. REGULATORY INFORMATION (Continued)

is suitable for their purposes.

16. OTHER INFORMATION

MSDS DATE..... January 14, 1997
CHANGES SINCE PREVIOUS ISSUE..... Section 2; Section 11; Section 15

FOR REGULATORY INFORMATION, CONTACT:

James A. Kocsis
Regulatory Coordinator
Specialty Synthetic Polymers Division
National Starch & Chemical Company
Finderne Avenue, P.O. Box 6500
Bridgewater, NJ 08807
USA
Telephone: 908-707-3750
FAX: 908-685-7073

10/23/86

Chemicals Group
Air Products and Chemicals, Inc.
P.O. Box 2662
Allentown, PA 18001

AIR PRODUCTS

July 31, 1986

AMERICAN GLUE
P O BOX 86
MIDDLETON
MA
01949

Attn: CHERYL AUTERIO

Thank you for your recent interest in AIRFLEX 300. We appreciate the opportunity of providing you this information, and if a sample was requested, it is being sent to your attention free of charge.

AIRFLEX 300 is manufactured by our Polymer Chemical Division and the attached MSDS is being forwarded to you via our automatic computerized MSDS program. Under this program you will automatically be sent an MSDS whenever you place a sample request, an individual MSDS literature request, or whenever an MSDS is updated, provided you were sampled or requested a MSDS within the previous twenty-four months.

For this MSDS to serve its intended purpose, as an effective means of hazard communication, we request that you pass it along to all personnel that either handle or use the product and also those that are involved with the design, implementation, or any other operation involving use of this product. Should you require any additional assistance, please contact our Product Information Center at (800) 345-3148 or (215) 481-6799 in Pennsylvania or Internationally.

Once again, thank you for your interest.

Sincerely,

L. G. Clarke, III
Chemicals Group
Manager Sales Service

LGC/pjp
0236I/040

JJL

Air Products and Chemicals, Inc.
Box 538
Allentown, PA 18105

MATERIAL SAFETY DATA SHEET

AIR PRODUCTS

EMERGENCY TELEPHONE NUMBERS
800-523-9374 (except PA) 800-322-9092 (PA only) 215-481-4911 (outside U.S.A.)

POLYVINYL ACETATE EMULSION PRODUCTS

I--PRODUCT IDENTIFICATION

Manufacturing Site
Calvert City, Kentucky;
South Brunswick, New Jersey;
Elkton, MD; Cleveland, Ohio;
City of Industry, CA.

Business Contact
Product Manager
Polymer Chemicals Department

Sales Office
P.O. Box 538
Allentown, Pennsylvania 18105

Sales Phone
(800) 345-3148

Issue Date, Revision 2
February 1983

Trade Name
AIRFLEX® 130, 300, 320, 370, 400, 400H, 403DEV, 405, 410, 416, TL-32 DEV

Chemical Names and Synonyms
Vinyl Acetate Copolymer Emulsions

Chemical Family
Polyvinyl Acetate Emulsions

Formula
A_x-B_y
Where A = $C_4H_6O_2$
B = C_2H_4

Chemical Abstract Registry Numbers
Vinyl Acetate/Ethylene Copolymer 24937-78-8

Recommended Emergency Procedure to Minimize Environmental Impact:

Spills should be contained and cleaned up expeditiously. Automobiles or other personal property should be washed quickly before the material dries. With approval from the municipal sewage authority, or water pollution agency, small quantities of spilled material can be disposed of in an industrial sewer at very low concentrations. Municipal sewage treatment plants may not remove the white color imparted to the water by the emulsions.

Chemical coagulation of diluted emulsion is accomplished by the addition of ferric chloride and lime, maintaining a pH of 8 and mixing slowly. The settled sludge can be disposed of in approved landfill sites. Consult manufacturer for detailed procedure. A non-toxic biodegradable anti-foam agent such as Nalco D71-D5, or equivalent, can be used for eliminating foam.

All federal, state and local regulations regarding health and pollution should be followed when disposing of contaminated water or recovered material.

Dike spills. A large quantity of material spilled in the presence of rainfall could cause the spill to travel long distances or reach waterways. Once emulsion is spilled into water, methods of removal or neutralization can cause more harm to the aquatic system than if no action is taken.

VIII--SPECIAL PROTECTION INFORMATION

Rubber protective gloves are recommended. Use safety goggles when splash potential exists. See Sections IV and V for specific health and fire hazard information and protective measures.

IX--SPECIAL PRECAUTIONS

Normal cleanliness should be observed. Store in a cool place, avoid freezing, minimize contact with air to prevent innoculation with microorganisms which can cause decomposition and moldy overgrowth.

If headspace ventilation is required, use humidified air to reduce skin formation on the emulsion surface.

Regulatory Concerns:

The products are not restricted articles according to Department of Transportation and International Air Transport Association regulations.

II--HAZARDOUS INGREDIENTS

Products are stable dispersions of very small polymer particles in water. The emulsions contain formaldehyde at concentrations less than 0.1% by weight. No other photochemically-reactive solvents or reactive chemical solvents are added. Solids content is 47-55% by weight (see specifications) which consist of polymer, surfactant and/or hydrocolloid stabilizers and minor amounts of inorganic salts.

The solid portion is combustible and will decompose under pyrolysis conditions. Residual unpolymerized monomer levels are less than 0.5% of the total product.

No heavy metal or heavy metal compounds, including those of lead or mercury, are utilized in the manufacture of these emulsions. However, due to the ubiquitous nature of these materials, trace quantities (ppm or ppb) can possibly be found by using modern analytical techniques.

III--PHYSICAL DATA

Appearance	White, mobile liquid	Boiling Point	100°C
Viscosity	100-3000 cps, depending on product*	Volatiles (% by volume)	45-53
Odor	Pleasant, sweet	Specific Gravity (H_2O=1)	1.1
pH	4-7, Depending on product	Density	9 lbs/gal
Solubility in Water	Water miscible. Care! Dilution with water generally will lower dispersion stability.		

*Brookfield Viscosimeter, Model LVF (No.2 or No. 3 spindle, 60 RPM, 77°F).

IV--FIRE AND EXPLOSION DATA

Extinguishing Media:

For dry polymer use water or carbon dioxide.

Special Fire Fighting Procedures:

When polymer burns, water (H_2O) carbon dioxide (CO_2), carbon monoxide (CO) and smoke are produced. Pryolysis products may include such materials as acetic acid, acrolein and acetaldehyde. Masks to remove smoke and organic vapor from respirable air are recommended for use when fighting fires involving vinyl acetate polymers and copolymers. There are no unusual fire or explosion hazards.

V--HEALTH HAZARD INFORMATION

The principal volatile component is water. Minor volatile components are formaldehyde and vinyl acetate (see Hazardous Ingredients Section II). Formaldehyde is added to these emulsion products as a preservative. Both minor components will migrate from the emulsion and establish an equilibrium condition between headspace in the storage container and the liquid emulsion. Levels in excess of the TLV's (1 ppm for formaldehyde, 10 ppm for vinyl acetate) can accumulate in non-vented headspaces above stored emulsion. Care must be exercised to vent headspace of storage tanks with humidified air. Drums should be opened in a well ventilated space.

The Threshold Limit Value (TLV) for vinyl acetate is 10 ppm Time Weighted Average (TWA), 8 hours American Conference of Government Industrial Hygienists (ACGIH) and for formaldehyde is 1 ppm TWA, 8 hours (ACGIH). Under normal conditions of use in well-ventilated areas, the concentration of vinyl acetate in the workplace arising from the residual monomer in these polymer emulsions will not exceed the TLV. However, formaldehyde concentrations in the workplace may exceed the TLV under some conditions of use.

Toxicological Properties:

Although formaldehyde is a minor volatile component of these emulsion products, it is important to recognize that recent test results have shown formaldehyde to cause cancer in laboratory animals.

Since this potential cancer hazard is not reflected in the TLV, we suggest institution of a work practice standard to minimize exposure to the lowest feasible level.

Formaldehyde is readily detected due to its irritant properties. The odor detection level varies among different individuals between 0.2 to 1 ppm. In addition, acclimation will occur from repeated exposure but sensitivity returns following rest periods away from the atmospheres containing formaldehyde. Whether a risk exists at levels below the odor threshold has not been determined.

There are no known symptoms of ingestion.

FIRST AID

Wash the skin with water and soap. If splashed in the eye, flush with copious quantities of water and seek medical advice.

Small ingested amounts are not believed to produce adverse health effects. Larger amounts (at least several ounces) should be removed from the stomach by induced vomiting or aspiration. No adverse health effects are anticipated. Call a physician.

VI--REACTIVITY DATA

Products are stable in most environments. Coagulation may occur following freezing, thawing or boiling.

Products will react violently with any water sensitive material such as sulfuric acid or alkali materials such as sodium or metal hydrides.

VII--SPILL OR LEAK PROCEDURES

If material is released or spilled, dam up to limit spreading. Mop up or absorb on inert material and place in containers. If spill occurs in enclosed area, ventilate. Polymer may be separated from water by addition of alum.

Note: spilled emulsion is very slippery. Use care to avoid falls. Latex will leave a film on drying. Remove saturated clothing and wash contacted skin areas with soap and water.

Waste Disposal:

For small spills (probably less than 100 gallons), dilute 50 to 100 fold with water. Wash into industrial sewer. (WARNING!Consult local sewer authority before discharging.)

For large quantities, place in settling pond and add ferric chloride and lime. Decant water. Dispose of solids in landfill. Emulsion can be incinerated directly under appropriate conditions.

Care: The products will impart a white milky color to water. When the water is agitated or is turbulent, foaming can result. As supplied or diluted, product material (foam included) when splashed on automobiles or other personal property is difficult to remove if allowed to dry.

Recommended Emergency Procedure to Minimize Environmental Impact:

Spills should be contained and cleaned up expeditiously. Automobiles or other personal property should be washed quickly before the material dries. With approval from the municipal sewage authority, or water pollution agency, small quantities of spilled material can be disposed of in an industrial sewer at very low concentrations. Municipal sewage treatment plants may not remove the white color imparted to the water by the emulsions.

Chemical coagulation of diluted emulsion is accomplished by the addition of ferric chloride and lime, maintaining a pH of 8 and mixing slowly. The settled sludge can be disposed of in approved landfill sites. Consult manufacturer for detailed procedure. A non-toxic biodegradable anti-foam agent such as Nalco D71-D5, or equivalent, can be used for eliminating foam.

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If headspace ventilation is required, use humidified air to reduce skin formation on the emulsion surface.

Regulatory Concerns:

The products are not restricted articles according to Department of Transportation and International Air Transport Association regulations.

3M Adhesives Division

3M Center
St. Paul, MN 55144-1000
1 800 364 3577
612 737 6501

3M

January 20, 1999

IT CORPORATION
Paul Ledoux
978/777-0975 fax
978/774-7298 tel

REF: JET MELT ® Brand Adhesive 3746

Dear Mr. Ledoux:

Per your request for a Material Safety Data Sheet (MSDS) on **JET MELT ® Brand Adhesive 3746 . This product is obsoleted. The purposes of the MSDS is for disposal information.**

If you need further assistance please contact James Beardsley Sr. Technologist, Adhesives Division, Tel. 651/733-1820.

Regards,

Cheryl L. Brunner
Product Responsibility Coordinator
3M Adhesives Division
3M Center, Building 209-1N-20
St. Paul, MN 55144-1000
TEL# 612/737-4574

To	Fax Copy	Date	# of pages ▶ 3
Co./Dept.	Paul Ledoux	From	C.L. BRUNNER
Phone #		Co.	3M ADHESIVES
Fax #	978-777-0975	Phone #	651-733-8734
		Fax #	651-737-3146

MATERIAL SAFETY DATA SHEET

3M
3M Center
St. Paul, Minnesota 55144
(612) 733-1110

Form 16593-C PWO

DUNS NO.: 00-617-3082

Chemical Family

Trade Name: JET MELT® Brand Adhesive 3746

3M I D Number: 62-3746-9930-4 AC&S Division

1. INGREDIENTS	CAS #	%	TLV® (unit)
Polyamide resin		100	

2. PHYSICAL DATA

Boiling Point	N.A.	Solubility in Water	Insoluble
Vapor Pressure	N.A.	Specific Gravity (H_2O=1)	0.98
Vapor Density (Air = 1)	N.A.	Percent Volatile	0
Evaporation Rate (ether =1)	N.A.	pH	N.A.

Appearance and Odor: Solid extrusion, essentially no odor

3. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): >500° F. Flammable Limits: LEL = N.A. UEL = N.A.

Extinguishing Media: CO_2, water, fog, foam, dry chemical

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

4. ENVIRONMENTAL INFORMATION

Spill Response

N.A.

Recommended Disposal

Product may be disposed of as ordinary non-hazardous solid waste.

Threshold Limit Values listed above are current to 1981. Because they are reviewed yearly by ACGIH and subject to change (usually to a lower value) it is necessary for the user of this Material Safety Data Sheet to maintain a list of revised T L V s and update the sheet periodically.

TRADE NAME: JET MELT® Brand Adhesive 3746

5. HEALTH HAZARD DATA

Eye Contact

Hot vapors can be moderately irritating to the eyes.

Skin Contact

Hot adhesive will burn skin. Vapors may be irritating to the skin.

Inhalation

Not applicable at room temperature. Vapors of hot adhesive may be irritating to the nose and throat.

Ingestion

Practically non-toxic orally.

Suggested First Aid

Skin contact: (Hot adhesive)--Immediately flush skin with cold water and cover with a clean dressing. DO NOT ATTEMPT TO REMOVE ADHESIVE. Have burn treated by a physician.

6. REACTIVITY DATA

STABILITY	☐ Unstable ☒ Stable	Conditions to Avoid: Store below 120° F.
INCOMPATABILITY		Materials to Avoid
HAZARDOUS POLYMERIZATION	☐ May Occur ☒ May Not Occur	Conditions to Avoid

Hazardous Decomposition Products

Thermal decomposition: Carbon dioxide, carbon monoxide and other unidentified organic compounds.

7. SPECIAL PROTECTION INFORMATION

Eye Protection	Skin Protection
Chemical safety glasses	Heavy duty gloves if contact is likely.

Ventilation

Mechanical ventilation adequate.

Respiratory and Special Protection

Other Protection

8. PRECAUTIONARY INFORMATION

Avoid contact with hot extruded adhesive or applicator tip. Avoid prolonged breathing of vapors.

9. DEPARTMENT OF TRANSPORTATION

DOT Proper Shipping Name	DOT Hazard Class
N.A.	N.A.

Issue Date	Supersedes
April, 1981	Feb. 1980